

**Evidence-
Based Scale
Worksheets**
Number Sense and Operations
MA.912.NSO.1.3 Generate equivalent algebraic expressions involving radicals or rational exponents using the properties of exponents.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	I can go beyond the standard. <ul style="list-style-type: none"> Teach someone else how to generate equivalent algebraic expressions involving radicals or rational exponents using the properties of exponents. 	
3	I understand the entire standard. <ul style="list-style-type: none"> Generate equivalent algebraic expressions involving radicals or rational exponents using the properties of exponents. 	Simplify each expression. <p>a. $\sqrt[5]{32z^{10}}$</p> <p>b. $\sqrt[4]{81x^4y^8}$</p> <p>c. $\sqrt[3]{\frac{p^6}{r^9}}$</p> <p>d. $\sqrt[7]{\frac{m^5}{m^{-2}n^{14}}}$</p>

MA.912.NSO.1.3 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Generate equivalent numerical expressions involving radical or rational exponents using the properties of exponents.	<p>Simplify each expression.</p> <p>a. $\frac{10}{10^{3/4}}$</p> <p>b. $\frac{\sqrt[4]{9} \cdot \sqrt[4]{27}}{\sqrt[4]{3}}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Evaluating powers with rational exponents.	<p>a. $64^{4/3}$</p> <p>b. $27^{-2/3}$</p>

Evidence-Based Scale Worksheets

Number Sense and Operations

MA.912.NSO.1.5 Add, subtract, multiply and divide algebraic expressions involving radicals.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that involves operations with radicals. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Add, subtract, multiply, and divide algebraic expressions involving radicals. 	<p>Perform each indicated operation and write the answer in simplest form. Assume all variables are positive.</p> <p>a. $\sqrt{50x^2} + \sqrt{18x^2}$</p> <p>b. $6y\sqrt{3} - \sqrt{75y^2}$</p> <p>c. $\sqrt[3]{32j^2k^3m^4} \cdot \sqrt[3]{2jkm^2}$</p> <p>d. $\sqrt[5]{q^{10}} \div \sqrt[5]{r^{12}}$</p>

MA.912.NSO.1.5 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Add, subtract, multiply, and divide numerical expressions involving radicals.	<p>Simplify each expression.</p> <p>a. $4\sqrt{5} + 7\sqrt{5}$</p> <p>b. $8\sqrt{2} - 3\sqrt{2}$</p> <p>c. $-3\sqrt[3]{5} \cdot (-4\sqrt[3]{25})$</p> <p>d. $\sqrt[4]{512} \div \sqrt[4]{32}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Define radical expressions and like radicals.	<p>Define each term.</p> <p>a. radical expression</p> <p>b. like radical</p>

MA.912.NSO.1.6 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Evaluate logarithmic expressions.	<p>Evaluate each logarithm.</p> <p>a. $\log_3 9$</p> <p>b. $\log_4 64$</p> <p>c. $\log_2 32$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Rewrite equations involving exponents in logarithmic form.	<p>Rewrite each equation in logarithmic form.</p> <p>a. $7^2 = 49$</p> <p>b. $216^{2/3} = 36$</p> <p>c. $27^{-1/3} = \frac{1}{3}$</p>

Evidence-Based Scale Worksheets

Number Sense and Operations

MA.912.NSO.1.7 Given an algebraic logarithmic expression, generate an equivalent algebraic expression using the properties of logarithms or exponents.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to use the properties of logarithms or exponents to generate an equivalent algebraic expression. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given an algebraic logarithmic expression, generate an equivalent algebraic expression using properties of logarithms. 	<p>a. Expand the expression.</p> $\log\left(\frac{a^5 b^2}{c^3}\right)$ <p>b. Condense the expression.</p> $3 \ln x + 4 \ln y - \ln z$

MA.912.NSO.1.7 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Simplify logarithmic expressions using inverse properties. 	<p>Simplify each expression.</p> <p>a. $\ln e^{3x}$</p> <p>b. $11^{\log_{11}(z+5)}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify the properties of logarithms. 	<p>Which expressions are equivalent?</p> <p>a. $\log_n(ab)$ d. $\log_n a - \log_n b$</p> <p>b. $\log_n\left(\frac{a}{b}\right)$ e. $b \log_n a$</p> <p>c. $\log_n a^b$ f. $\log_n a + \log_n b$</p>

**Evidence-
Based Scale
Worksheets**
Number Sense and Operations

MA.912.NSO.2.1 Extend previous understanding of the real number system to include the complex number system. Add, subtract, multiply and divide complex numbers.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write and solve a word problem that involves operations with complex numbers. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Add, subtract, multiply, and divide complex numbers. 	<p>Write each expression as a complex number in standard form.</p> <p>a. $(3 + 4i) + (7 - 8i)$</p> <p>b. $(12 - 5i) - (7 + 3i)$</p> <p>c. $(4 + 3i)(5 - 2i)$</p> <p>d. $\frac{8 + 3i}{5 - 2i}$</p>

MA.912.NSO.2.1 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Use the imaginary unit i to rewrite square roots of negative numbers.	<p>Find the square root of each number.</p> <p>a. $\sqrt{-36}$</p> <p>b. $\sqrt{-121}$</p> <p>c. $-2\sqrt{-25}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Define the imaginary unit i.	<p>Define the imaginary unit i.</p>

Evidence-Based Scale Worksheets

Number Sense and Operations

H MA.912.NSO.4.1 Given a mathematical or real-world context, represent and manipulate data using matrices.

Circle the scale that best demonstrates your knowledge of the standard.

Description

4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to represent and manipulate data using matrices. 																										
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a mathematical or real-world context, represent and manipulate data using matrices. 	<p>The table shows prices at a clothing store in 2019 and 2020.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="2">T-shirt</th> <th colspan="2">Polo Shirt</th> </tr> <tr> <th>Size</th> <th>2019</th> <th>2020</th> <th>2019</th> <th>2020</th> </tr> </thead> <tbody> <tr> <td>Small</td> <td>9.95</td> <td>10.05</td> <td>18.50</td> <td>19.00</td> </tr> <tr> <td>Medium</td> <td>9.95</td> <td>10.25</td> <td>18.75</td> <td>19.00</td> </tr> <tr> <td>Large</td> <td>10.50</td> <td>11.00</td> <td>19.00</td> <td>19.50</td> </tr> </tbody> </table> <p>Organize the data using two matrices, one for each year. Then find a matrix that gives the change in price from 2019 to 2020 by type of shirt.</p>		T-shirt		Polo Shirt		Size	2019	2020	2019	2020	Small	9.95	10.05	18.50	19.00	Medium	9.95	10.25	18.75	19.00	Large	10.50	11.00	19.00	19.50
	T-shirt		Polo Shirt																								
Size	2019	2020	2019	2020																							
Small	9.95	10.05	18.50	19.00																							
Medium	9.95	10.25	18.75	19.00																							
Large	10.50	11.00	19.00	19.50																							

MA.912.NSO.4.1 (continued) H

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Interpret data represented in matrices. 	<p>A store sells T-shirts in sizes small, medium, and large. The matrix represents the number of red, blue, and gray T-shirts that the store has in stock.</p> $ \begin{array}{c} \\ \\ \end{array} \begin{array}{ccc} S & M & L \\ \hline \text{Red} & \begin{bmatrix} 12 & 8 & 15 \end{bmatrix} \\ \text{Blue} & \begin{bmatrix} 15 & 14 & 22 \end{bmatrix} \\ \text{Gray} & \begin{bmatrix} 11 & 9 & 14 \end{bmatrix} \end{array} $ <p>a. How many medium red T-shirts are in stock?</p> <p>b. How many large T-shirts are in stock?</p> <p>c. How many gray T-shirts are in stock?</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify components of matrices. 	$ A = \begin{bmatrix} 2 & 5 & 1 & 7 \\ 8 & 4 & 9 & 3 \\ -1 & 0 & 4 & 6 \end{bmatrix} $ <p>a. What are the dimensions of matrix A?</p> <p>b. What is the entry in the second row, third column of matrix A?</p>

Evidence-Based Scale Worksheets

Number Sense and Operations

H MA.912.NSO.4.2 Given a mathematical or real-world context, represent and solve a system of two- or three-variable linear equations using matrices.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved using a system of linear equations represented as a matrix. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, represent and solve a system of two- or three-variable linear equations using matrices. 	<p>Three students go shopping at the student store. The first student buys one eraser, one notebook, and one pen for \$6.35. The second student buys one eraser, two notebooks, and two pens for \$11.50. The third student buys two erasers, three notebooks, and one pen for \$11.05. Write a matrix equation to represent the situation. Then find the cost of each item.</p>

MA.912.NSO.4.2 (continued) H

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">• Represent and solve a system of two- or three-variable linear equations using matrices.	Use Cramer's Rule to solve the linear system. $2x + 3y - 5z = -3$ $3x + 2y + 4z = 12$ $2x - 4y + 7z = 23$
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">• Define Cramer's Rule.	Define Cramer's Rule.

Evidence-Based Scale Worksheets

Number Sense and Operations

H MA.912.NSO.4.3 Solve mathematical and real-world problems involving addition, subtraction and multiplication of matrices.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																								
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve mathematical and real-world problems involving addition, subtraction, and multiplication of matrices. 																									
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve real-world problems involving addition, subtraction, and multiplication of matrices. 	<p>Two students collect T-shirt orders for a field day. The orders collected by each student are represented by the matrices below. Some of the orders are fulfilled using 4 large blue T-shirts and 3 small green T-shirts left over from last year's field day, and the remainder are purchased new. How much money is spent on T-shirts of each color when new large T-shirts cost \$10 and new small T-shirts cost \$8?</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="2" style="text-align: center;">Student A</th> <th></th> <th colspan="2" style="text-align: center;">Student B</th> </tr> <tr> <th></th> <th style="text-align: center;">Small</th> <th style="text-align: center;">Large</th> <th></th> <th style="text-align: center;">Small</th> <th style="text-align: center;">Large</th> </tr> </thead> <tbody> <tr> <td>Blue</td> <td style="text-align: center;">$\begin{bmatrix} 5 & 6 \end{bmatrix}$</td> <td></td> <td>Blue</td> <td style="text-align: center;">$\begin{bmatrix} 2 & 2 \end{bmatrix}$</td> <td></td> </tr> <tr> <td>Green</td> <td style="text-align: center;">$\begin{bmatrix} 7 & 8 \end{bmatrix}$</td> <td></td> <td>Green</td> <td style="text-align: center;">$\begin{bmatrix} 6 & 5 \end{bmatrix}$</td> <td></td> </tr> </tbody> </table>		Student A			Student B			Small	Large		Small	Large	Blue	$\begin{bmatrix} 5 & 6 \end{bmatrix}$		Blue	$\begin{bmatrix} 2 & 2 \end{bmatrix}$		Green	$\begin{bmatrix} 7 & 8 \end{bmatrix}$		Green	$\begin{bmatrix} 6 & 5 \end{bmatrix}$	
	Student A			Student B																						
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Blue	$\begin{bmatrix} 5 & 6 \end{bmatrix}$		Blue	$\begin{bmatrix} 2 & 2 \end{bmatrix}$																						
Green	$\begin{bmatrix} 7 & 8 \end{bmatrix}$		Green	$\begin{bmatrix} 6 & 5 \end{bmatrix}$																						

MA.912.NSO.4.3 (continued) **H**

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Add, subtract, and multiply matrices. 	<p>Perform the indicated operation, if possible. If not, explain why not.</p> <p>a. $\begin{bmatrix} 4 & -7 \\ -5 & 4 \end{bmatrix} \begin{bmatrix} -1 & 6 \\ 3 & 2 \end{bmatrix}$</p> <p>b. $\begin{bmatrix} -9 & 4 & 7 \\ -1 & 5 & 9 \end{bmatrix} - \begin{bmatrix} -2 & 8 & -4 \\ 0 & 4 & 6 \end{bmatrix}$</p> <p>c. $\begin{bmatrix} -6 & 0 \\ 5 & 9 \end{bmatrix} + \begin{bmatrix} 6 & 0 \\ -5 & -9 \end{bmatrix}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify whether it is possible to find a sum, difference, or product of matrices. 	<p>Without calculating, determine whether it is possible to perform the indicated operation. Explain your reasoning.</p> <p>a. $\begin{bmatrix} 3 \\ -2 \end{bmatrix} + [7 \ 1]$</p> <p>b. $\begin{bmatrix} 2 & 4 \\ 9 & 5 \end{bmatrix} [6 \ -7]$</p> <p>c. $\begin{bmatrix} 1 & 3 & -1 \\ 1 & 2 & 1 \\ -3 & 2 & 1 \end{bmatrix} - \begin{bmatrix} 4 & 5 & 4 \\ -5 & 5 & -5 \\ 2 & 4 & -5 \end{bmatrix}$</p>

Evidence-Based Scale Worksheets

Number Sense and Operations

H MA.912.NSO.4.4 Solve mathematical and real-world problems using the inverse and determinant of matrices.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved using inverses or determinants of matrices. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve real-world problems using the inverse and determinant of matrices. 	<p>A bag that contains 6 pieces of taffy, 8 pieces of hard candy, and 3 pieces of licorice costs \$1.68. A bag that contains 4 pieces of taffy, 6 pieces of hard candy, and 8 pieces of licorice costs \$2.36. A bag that contains 5 pieces of taffy, 5 pieces of hard candy, and 5 pieces of licorice costs \$1.80. What is the cost per piece for each type of candy?</p>

MA.912.NSO.4.4 (continued) H

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Solve mathematical problems using the inverse and determinant of matrices. 	<p>a. Find the area of the triangle with vertices $(-3, -2)$, $(1, 4)$, and $(4, -1)$.</p> <p>b. Solve the system of equations using Cramer's Rule.</p> $3x + 2y = 10$ $4x + 5y = 11$ <p>c. Solve the matrix equation.</p> $\begin{bmatrix} 2 & -3 \\ 5 & 1 \end{bmatrix} X = \begin{bmatrix} -7 & -14 \\ 8 & -18 \end{bmatrix}$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Find inverses of square matrices. 	<p>Find the inverse of the matrix or explain why the inverse does not exist.</p> <p>a. $\begin{bmatrix} 3 & 2 \\ 9 & 7 \end{bmatrix}$</p> <p>b. $\begin{bmatrix} 3 & 2 \\ 6 & 4 \end{bmatrix}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.1.1 Identify and interpret parts of an equation or expression that represent a quantity in terms of a mathematical or real-world context, including viewing one or more of its parts as a single entity.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to identify and interpret parts of an equation or expression that represent a quantity in terms of a mathematical or real-world context. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Identify and interpret parts of an equation or expression that represent a quantity in terms of a real-world context, including viewing one or more of its parts as a single entity. 	<p>The amount y (in grams) of gallium-68 remaining after t minutes is given by $y = a_0(0.5)^{t/68}$, where a_0 is the initial amount. What percent of the gallium-68 decays each minute?</p>

MA.912.AR.1.1 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Identify and interpret parts of an equation that represent a quantity in terms of a mathematical context.	<p>a. Find the slope and intercepts of the graph of the linear equation.</p> $y = 4x + 16$ <p>b. Find the intercepts of the graph of the quadratic equation.</p> $y = 3(x - 1)(x + 4)$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Identify terms and like terms in an expression.	<p>Identify the terms and like terms in the expression.</p> $2 + 3n + 0.5m + 2.5n + m + 4$

**Evidence-
Based Scale
Worksheets**
Algebraic Reasoning
MA.912.AR.1.3 Add, subtract and multiply polynomial expressions with rational number coefficients.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	I can go beyond the standard. <ul style="list-style-type: none"> Solve real-world problems using operations with polynomial expressions with rational number coefficients. 	A rectangular garden has a length of $2x - 15$ feet and a width of $2x^2 - 3x + 5$ feet. Write an expression that represents the perimeter of the garden.
3	I understand the entire standard. <ul style="list-style-type: none"> Add, subtract, and multiply polynomial expressions with rational number coefficients. 	Perform the indicated operation. <p style="margin-left: 40px;">a. $(3x^2 + 5x - 10) + (5x^2 - 7x + 2)$</p> <p style="margin-left: 40px;">b. $(7x^2 + 6x - 3) - (4x^2 - x + 6)$</p> <p style="margin-left: 40px;">c. $(2x + 3)(3x^2 - 7x + 4)$</p>

MA.912.AR.1.3 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">• Add, subtract, and multiply binomial expressions.	Perform the indicated operation. a. $(2x - 9) + (7x - 5)$ b. $(4x + 7) - (6x - 1)$ c. $(2x + 3)(7x - 4)$
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">• Simplify an expression by combining like terms.	Perform the indicated operation. a. $7n + 5n$ b. $4a - 9a$

**Evidence-
Based Scale
Worksheets****Algebraic Reasoning****MA.912.AR.1.5** Divide polynomial expressions using long division, synthetic division or algebraic manipulation.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	I can go beyond the standard. <ul style="list-style-type: none">Teach someone else how to divide polynomial expressions using synthetic division.	
3	I understand the entire standard. <ul style="list-style-type: none">Divide polynomial expressions using long division and synthetic division.	Find each quotient. a. $(x^3 + 29) \div (x + 3)$ b. $(6x^3 - 7x^2 + 8x - 3) \div (2x - 1)$

MA.912.AR.1.5 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Divide polynomial expressions by monomials.	<p>Find the quotient.</p> $\frac{12x^3 - 8x^2 + 16x}{4x}$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Divide integers and decimals using long division.	<p>Find each quotient.</p> <p>a. $16 \overline{)336}$</p> <p>b. $0.6 \overline{)2.04}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.1.6 Solve mathematical and real-world problems involving the addition, subtraction, multiplication or division of polynomials.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to solve real-world problems involving the addition, subtraction, multiplication, or division of polynomials. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Solve real-world problems involving the addition, subtraction, multiplication, or division of polynomials. 	<p>You are designing a rectangular loading zone for buses. To ensure that large numbers of people can easily enter and leave the loading zone, you want the area (in meters squared) of the loading zone to be small relative to the perimeter (in meters). The length of the loading zone is $x^2 - 4x + 1$ meters and the width of the loading zone is $2x + 1$ meters. Find the quotient of the area and perimeter in terms of x.</p>

MA.912.AR.1.6 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Solve mathematical problems involving the addition, subtraction, multiplication, or division of polynomials.	<p>Perform the indicated operation.</p> <p>a. $(2x - 3)(5x^2 + 7x + 2)$</p> <p>b. $(6x^3 - 7x^2 + 10x + 5) \div (2x - 1)$</p> <p>c. $(2x^2 + 3x - 7) + (5x^3 - 7x + 2)$</p> <p>d. $(4x^3 - 2x^2 - 7x) - (3x^2 - 4x + 2)$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Find sums, differences, products, and quotients of monomials.	<p>Perform the indicated operation.</p> <p>a. $5x - 3x$ b. $12y + (-3y)$</p> <p>c. $m(4m)$ d. $\frac{6p}{3p}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.1.8 Rewrite a polynomial expression as a product of polynomials over the real or complex number system.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to factor polynomials completely. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Factor polynomials over the real or complex number system. 	<p>Factor each expression.</p> <p>a. $x^3 + 27$</p> <p>b. $4n^2 + 9$</p> <p>Factor each polynomial completely.</p> <p>c. $5p^{10} + 22p^9 + 21p^8$</p> <p>d. $4m^4 + 8m^3 - 4m - 8$</p>

**Evidence-
Based Scale
Worksheets**
Algebraic Reasoning
MA.912.AR.1.9 Apply previous understanding of rational number operations to add, subtract, multiply and divide rational algebraic expressions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	I can go beyond the standard. <ul style="list-style-type: none"> Teach someone else how to add, subtract, multiply, and divide rational algebraic expressions. 	
3	I understand the entire standard. <ul style="list-style-type: none"> Add, subtract, multiply, and divide rational algebraic expressions. 	Perform the indicated operation. <p>a. $\frac{3}{x^2 + x - 6} - \frac{2}{x^2 + 2x - 8}$</p> <p>b. $\frac{x^2 - 2x - 8}{x^2 + 7x + 12} \div \frac{x^2 - 7x + 12}{x^2 - 9}$</p> <p>c. $\frac{x + 3}{x^2 + 3x + 2} + \frac{x + 2}{x^2 + 4x + 3}$</p> <p>d. $\frac{x^2 - 16}{x} \cdot \frac{x^2 - 4x}{x^2 + 7x + 12}$</p>

MA.912.AR.1.9 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Add or subtract rational algebraic expressions with common denominators.• Multiply or divide rational algebraic expressions with factored numerators and denominators.	<p>Perform the indicated operation.</p> <p>a. $\frac{4x + 5}{x^2 + 7x + 10} + \frac{2x - 7}{x^2 + 7x + 10}$</p> <p>b. $\frac{(x - 5)(x + 5)}{9} \cdot \frac{3}{x - 5}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Add, subtract, multiply, and divide fractions.	<p>Perform the indicated operation.</p> <p>a. $\frac{3}{4} + \frac{1}{10}$</p> <p>b. $\frac{11}{12} - \frac{1}{2}$</p> <p>c. $\frac{21}{4} \cdot \frac{2}{7}$</p> <p>d. $\frac{5}{6} \div \frac{6}{5}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

H MA.912.AR.1.11 Apply the Binomial Theorem to create equivalent polynomial expressions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to find binomial expansions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Apply the Binomial Theorem to create equivalent polynomial expressions. 	Use the Binomial Theorem to expand $(2x - 1)^5$.

MA.912.AR.1.11 (continued) **H**

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">• Calculate binomial coefficients using combinations.	Find the coefficient of x^5y^3 in the expansion of $(2x + y)^8$.
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">• Calculate binomial coefficients using Pascal's Triangle.	The first rows of Pascal's Triangle are given. 0th row 1 1st row 1 1 2nd row 1 2 1 3rd row 1 3 3 1 Find the 5 th row of the triangle.

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.3.2 Given a mathematical or real-world context, write and solve one-variable quadratic equations over real and complex number systems.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved with a one-variable quadratic equation. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, write and solve one-variable quadratic equations over real and complex number systems. 	<p>A rectangular lawn has a width of 12 feet and a length of 20 feet. The lawn is expanded so that the length and width each increase by x feet, and the area of the lawn doubles.</p> <p>a. Write an equation that models the situation.</p> <p>b. By how much do the length and width of the lawn increase? Round to the nearest tenth, if necessary.</p>

MA.912.AR.3.2 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">Given a mathematical context, solve one-variable quadratic equations over real and complex number systems.	Solve each quadratic equation. a. $x^2 - 8x - 20 = 0$ b. $2x^2 - 3x = 7$
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">Recall the quadratic formula.	State the quadratic formula.

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.3.3 Given a mathematical or real-world context, write and solve one-variable quadratic inequalities over the real number system. Represent solutions algebraically or graphically.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to write and solve one-variable quadratic inequalities over the real number system. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Given a real-world context, write and solve one-variable quadratic inequalities over the real number system. • Represent solutions of one-variable quadratic inequalities algebraically or graphically. 	<p>A farmer uses 1000 feet of fencing to enclose a rectangular field. The area of the field is at least 40,000 square feet. Write an inequality that represents the situation. Then solve the inequality and graph the solution.</p>

MA.912.AR.3.3 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">• Solve one-variable quadratic inequalities over the real number system.• Represent solutions of one-variable quadratic inequalities algebraically or graphically.	Solve the inequality algebraically. Graph the solution on a number line. $x^2 + 10 > 7x$
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">• Solve one-variable quadratic equations.	Solve the equation. $x^2 + 3x - 28 = 0$

Evidence-Based Scale Worksheets

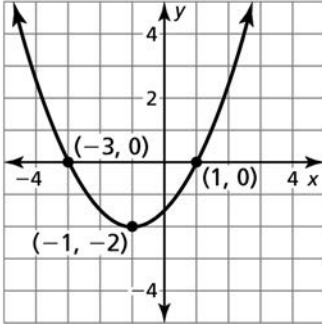
Algebraic Reasoning

MA.912.AR.3.4 Write a quadratic function to represent the relationship between two quantities from a graph, a written description or a table of values within a mathematical or real-world context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence										
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved by writing a quadratic function to represent the relationship between two quantities. 											
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Write a quadratic function to represent the relationship between two quantities from a graph, a written description, or a table of values within a real-world context. 	<p>a. A tennis player hits a ball in the air from a height of 5 feet. The ball has an initial vertical velocity of 20 feet per second. Write a function that represents the height of the ball over time.</p> <p>b. Write a function that models the temperature of the chemical over time.</p> <div data-bbox="912 1066 1264 1461" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Chemical Temperature</p> </div> <p>c. Write a function h that models the elevation of the hot air balloon after m minutes.</p> <table border="1" data-bbox="912 1680 1284 1785" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>m</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>$h(m)$</td> <td>46</td> <td>67</td> <td>92</td> <td>121</td> </tr> </tbody> </table>	m	4	5	6	7	$h(m)$	46	67	92	121
m	4	5	6	7								
$h(m)$	46	67	92	121								

MA.912.AR.3.4 (continued)

	Description	Evidence												
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Write a quadratic function to represent the relationship between two quantities from a graph, a written description, or a table of values within a mathematical or context. 	<p>a. Write an equation in standard form for the quadratic function whose graph is shown.</p> <div style="text-align: center;">  </div> <p>b. Write a quadratic function in standard form whose graph has vertex $(2, 7)$ and passes through the point $(0, -1)$.</p> <p>c. The table represents a quadratic function. Write an equation of the function in standard form.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">f(x)</td> <td style="text-align: center;">23</td> <td style="text-align: center;">8</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">-4</td> <td style="text-align: center;">-1</td> </tr> </table>	x	-1	0	1	2	3	f(x)	23	8	-1	-4	-1
x	-1	0	1	2	3									
f(x)	23	8	-1	-4	-1									
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Find the vertex and intercepts of the graph of a quadratic function. 	<p>a. What is the vertex of the graph of $f(x) = x^2 - 10x - 7$?</p> <p>b. What are the x-intercepts of the graph of $g(x) = 3x^2 - 18x - 21$?</p>												

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.3.8 Solve and graph mathematical and real-world problems that are modeled with quadratic functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to interpret key features and determine constraints of a quadratic function in terms of a context. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph real-world problems that are modeled with quadratic functions. Interpret key features and determine constraints of quadratic functions in terms of the context. 	<p>The height y (in feet) of a soccer ball x seconds after it is kicked can be modeled by the function $y = -16x^2 + 24x$. Graph the function. Find and interpret the domain and range of the function, when the function is increasing and decreasing, and the vertex of the function.</p>

MA.912.AR.3.8 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">Graph mathematical problems that are modeled with quadratic functions.	Graph the function. $f(x) = 3x^2 + 9x - 5$
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">Identify the x-intercepts of a quadratic function written in factored form.	Identify the x-intercepts of the function. $y = -2(x - 1)(x + 3)$

Evidence-Based Scale Worksheets

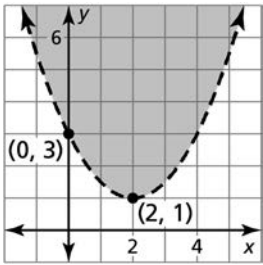
Algebraic Reasoning

MA.912.AR.3.9 Given a mathematical or real-world context, write two-variable quadratic inequalities to represent relationships between quantities from a graph or a written description.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved by writing a two-variable quadratic inequality to represent a relationship between quantities. 	
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, write two-variable quadratic inequalities to represent relationships between quantities from a graph or a written description. 	<p>a. The graph shows the safe working load in pounds, w, for a steel cable with diameter in inches, d. Write a quadratic inequality represented by the graph.</p> <div data-bbox="911 982 1422 1465" data-label="Figure"> </div> <p>b. A rectangular flower bed has a perimeter of 40 feet and must have an area of at least A square feet. Write a quadratic inequality that represents the situation.</p>

MA.912.AR.3.9 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Write two-variable quadratic inequalities to represent relationships between quantities from a graph. 	<p>Write the inequality represented by the graph.</p> 
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Solve a one-variable quadratic inequality algebraically. 	<p>Solve the inequality.</p> $x^2 - 2x \leq 15$

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.3.10 Given a mathematical or real-world context, graph the solution set to a two-variable quadratic inequality.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to graph the solution set of a two-variable quadratic inequality. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, graph the solution set of a two-variable quadratic inequality. 	<p>A shelf in a cabinet can support a mass M (in kilograms) provided $M \leq 55x^2$, where x is the thickness (in centimeters) of the shelf. Graph the inequality.</p>

MA.912.AR.3.10 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">Given a mathematical context, graph the solution set of two-variable quadratic inequality.	Graph the inequality $y > x^2 + 3x + 4$.
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">Graph the solution set of a one-variable quadratic inequality on a number line.	Graph the solution of the inequality on a number line. $2x^2 + 3x - 5 \geq 0$

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.4.2 Given a mathematical or real-world context, write and solve one-variable absolute value inequalities. Represent solutions algebraically or graphically.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to write and solve one-variable absolute value inequalities. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Given a real-world context, write and solve one-variable absolute value inequalities. • Represent solutions of one-variable absolute value inequalities algebraically or graphically. 	<p>An assembly line manufactures bolts. To be acceptable, the length of the bolts must be 5 centimeters long with an absolute deviation of 0.04 centimeter. Write an absolute value inequality to model the situation. Then solve the inequality and graph the solution.</p>

MA.912.AR.4.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given a mathematical context, solve one-variable absolute value inequalities.Represent solutions of one-variable absolute value inequalities algebraically or graphically.	<p>Solve each inequality and graph the solution.</p> <p>a. $x + 1 \leq 4$</p> <p>b. $2 x - 3 > 8$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Solve one-variable absolute value equations.	<p>Solve the equation.</p> $ 3x + 5 = 1$

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.4.4 Solve and graph mathematical and real-world problems that are modeled with absolute value functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to interpret key features and determine constraints of an absolute value function in terms of a context. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph real-world problems that are modeled with absolute value functions. Interpret key features and determine constraints of an absolute value function in terms of the context. 	<p>A truck turns onto the interstate at 10 a.m. and begins traveling at a speed of 60 miles per hour. The truck’s distance from Abilene in miles y is given by the function $y = 100 - 60x$, where x is the number of hours since 10 a.m. The truck will stop at 2 P.M.</p> <ol style="list-style-type: none"> Find and interpret the y-intercept of the graph of the function. Find and interpret the vertex of the graph of the function. Find the intervals where the function is increasing and decreasing.

MA.912.AR.4.4 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Graph mathematical problems that are modeled with absolute value functions. 	<p>Graph the function $f(x) = 3 - x + 2$.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Identify key features of an absolute value function. 	<p>Find the domain and range of the function, when the function is increasing and decreasing, the intercepts of the function, and the vertex of the function.</p> <p>$f(x) = 2 4 - x - 9$</p>

**Evidence-
Based Scale
Worksheets****Algebraic Reasoning**

MA.912.AR.5.2 Solve one-variable equations involving logarithms or exponential expressions. Interpret solutions as viable in terms of the context and identify any extraneous solutions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve one-variable equations involving logarithms or exponential expressions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve one-variable equations involving logarithms or exponential expressions. Interpret solutions as viable in terms of the context and identify any extraneous solutions. 	<p>Solve the equation. Round to the nearest ten-thousandth if necessary.</p> <p>a. $3^x = 10$</p> <p>b. $\log_2 x + \log_2(x + 6) = 4$</p>

MA.912.AR.5.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Evaluate logarithmic and exponential expressions.	<p>Evaluate the expression.</p> <p>a. $\log_4(32)$</p> <p>b. $3^2 - 5$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Rewrite equations involving exponents in logarithmic form.• Rewrite equations in logarithmic form in exponential form.	<p>a. Rewrite the equation in logarithmic form.</p> $5^3 = 125$ <p>b. Rewrite the equation in exponential form.</p> $\log_4 1024 = 5$

Evidence-Based Scale Worksheets

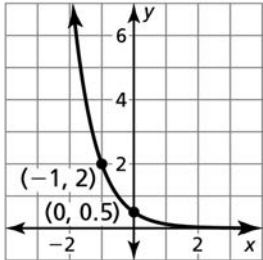
Algebraic Reasoning

MA.912.AR.5.4 Write an exponential function to represent a relationship between two quantities from a graph, a written description or a table of values within a mathematical or real-world context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence										
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to write an exponential function to represent a relationship between two quantities. 											
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Write an exponential function to represent a relationship between two quantities from a graph, a written description, or a table of values within a real-world context. 	<p>a. In 2010, the world population was 6.92 billion. In 2012 the population was 7.09 billion. Write an exponential function that represents the world population y (in billions) t years after 2010.</p> <p>b. The graph represents the price of a stock over time. Write an exponential function that represents the price of the stock p (in dollars) after d days.</p> <div data-bbox="912 1079 1264 1472" data-label="Figure"> </div> <p>c. You count the number of bacteria colonies on a petri dish each day. Write an exponential function that represents the number of colonies c after d days.</p> <table border="1" data-bbox="912 1692 1305 1797"> <tbody> <tr> <td>d</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>$c(d)$</td> <td>918</td> <td>306</td> <td>102</td> <td>34</td> </tr> </tbody> </table>	d	1	2	3	4	$c(d)$	918	306	102	34
d	1	2	3	4								
$c(d)$	918	306	102	34								

MA.912.AR.5.4 (continued)

	Description	Evidence																				
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Write an exponential function to represent a relationship between two quantities from a graph, a written description, or a table of values within a mathematical context. 	<p>Write an exponential function represented by the graph, description, or table.</p> <p>a. </p> <p>b. A function passes through (2, 3). As x increases by 1, y increases by 125%.</p> <p>c. <table border="1" data-bbox="778 968 1209 1073"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>80</td> <td>-40</td> <td>20</td> <td>-10</td> </tr> </table></p>	x	1	2	3	4	y	80	-40	20	-10										
x	1	2	3	4																		
y	80	-40	20	-10																		
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Determine whether an exponential function can represent a given data set. 	<p>Identify if an exponential function can represent the data in the table.</p> <p>a. <table border="1" data-bbox="783 1304 1214 1409"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>2</td> <td>5</td> <td>11</td> <td>20</td> </tr> </table></p> <p>b. <table border="1" data-bbox="783 1577 1214 1682"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>2</td> <td>6</td> <td>18</td> <td>54</td> </tr> </table></p>	x	1	2	3	4	y	2	5	11	20	x	1	2	3	4	y	2	6	18	54
x	1	2	3	4																		
y	2	5	11	20																		
x	1	2	3	4																		
y	2	6	18	54																		

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.5.5 Given an expression or equation representing an exponential function, reveal the constant percent rate of change per unit interval using the properties of exponents. Interpret the constant percent rate of change in terms of a real-world context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Given two exponential functions with different bases, compare the constant percent rate of change per unit interval. 	<p>The balance in account A after t years is given by the equation $y = Pe^{0.08t}$. The balance in account B after t years is given by $y = P(1.025)^{4t}$. Which account has a higher annual rate of return? Explain.</p>
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given an expression or equation representing an exponential function, reveal the constant percent rate of change per unit interval using the properties of exponents. Interpret the constant percent rate of change in terms of a real-world context. 	<p>The amount, y, of the radioactive substance tritium remaining after t years is $y = a(0.5)^{t/12.3}$, where a is the initial amount. What percent of the tritium decays each year?</p>

MA.912.AR.5.5 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given an expression or equation representing an exponential function, reveal the constant percent rate of change per unit interval using the properties of exponents.	<p>Identify the percent rate of change for the function.</p> <p>a. $y = 5500(1.03)^t$</p> <p>b. $f(t) = 4e^{-x/3}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Define exponential growth and exponential decay.	<p>a. Define exponential growth.</p> <p>b. Define exponential decay.</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.5.7 Solve and graph mathematical and real-world problems that are modeled with exponential functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve and graph mathematical and real-world problems modeled with exponential functions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph real-world problems that are modeled with exponential functions. Interpret key features and determine constraints of an exponential function in terms of the context. 	<p>According to Newton’s Law of Cooling, the temperature of an object with temperature T_0 placed in an area with surrounding temperature T_R will be $T = (T_0 - T_R)e^{-rt} + T_R$, where r is the cooling rate of the object. An object with temperature 40°C is placed in a freezer with temperature -20°C. The cooling rate of the object is $r = 0.05$.</p> <ol style="list-style-type: none"> Graph the function. Approximate the intervals where the temperature of the object is positive or negative. Find and interpret the asymptote of the graph of the function. What is the temperature of the object after 10 minutes?

MA.912.AR.5.7 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Identify key features of an exponential function. 	<p>Consider the function $y = 2e^{0.2x} - 6$.</p> <ol style="list-style-type: none"> a. Find the domain and range of the function. b. Find the x- and y-intercepts of the graph of the function. c. Find the intervals where the graph is positive or negative. d. Find the intervals where the function is increasing or decreasing. e. Find any asymptotes of the graph of the function.
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Identify key features of the parent exponential function. 	<p>Consider the function $f(x) = e^x$.</p> <ol style="list-style-type: none"> a. Find the domain and range of the function. b. Find the x- and y-intercepts of the graph of the function. c. Find the intervals where the graph is positive or negative. e. Find any asymptotes of the graph of the function.

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.5.8 Given a table, equation, or written description of a logarithmic function, graph that function and determine its key features.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence										
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to graph a logarithmic function and determine its key features. 											
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a table, equation, or written description of a logarithmic function, graph that function and determine its key features. 	<p>Graph each logarithmic function. Label any intercepts or asymptotes. Find the domain and range, intervals where the function is positive or negative, and intervals where the function is increasing or decreasing.</p> <p>a.</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="text-align: center;">x</td> <td style="text-align: center;">1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">9</td> <td style="text-align: center;">27</td> </tr> <tr> <td style="text-align: center;">f(x)</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> </tr> </table> <p>b. The function g is the inverse of the function $h(x) = 4^x$.</p> <p>c. $f(x) = \log_2(x - 2) - 1$</p>	x	1	3	9	27	f(x)	0	1	2	3
x	1	3	9	27								
f(x)	0	1	2	3								

MA.912.AR.5.8 (continued)

	Description	Evidence																
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Identify points on the graph of a logarithmic function. 	<p>Complete the table for the function $f(x) = \log_4 x$.</p> <table border="1" data-bbox="699 359 1249 468"> <tr> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>$f(x)$</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	x								$f(x)$	-3	-2	-1	0	1	2	3
x																		
$f(x)$	-3	-2	-1	0	1	2	3											
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Rewrite equations involving exponents in logarithmic form. Rewrite equations in logarithmic form in exponential form. 	<p>a. Rewrite the equation in logarithmic form.</p> $e^x = y$ <p>b. Rewrite the equation in exponential form.</p> $\log_2 x = y$																

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.5.9 Solve and graph mathematical and real-world problems that are modeled with logarithmic functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve and graph mathematical and real-world problems modeled with logarithmic functions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph mathematical and real-world problems that are modeled with logarithmic functions. Interpret key features and determine constraints of a logarithmic function in terms of the context. 	<p>A group of students was taught a new concept. They were then tested on the concept at 1-month intervals. The average score $s(t)$ for the group was modeled by the function $s(t) = 90 - 15 \ln(t + 1)$, where t is the number of months that have passed since the concept was taught.</p> <ol style="list-style-type: none"> Estimate the average score after 2 months. Estimate the number of months until the average score is below 50. Graph the function. Find and interpret the intercepts of the graph.

MA.912.AR.5.9 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">• Solve and graph mathematical problems that are modeled with logarithmic functions.	Find the x and y intercepts of the graph of $y = \log(x + 5) + 1$.
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">• Evaluate logarithmic functions.	Evaluate $f(x) = \ln(x - 3) + 2$ when $x = 7$. Round your answer to the nearest hundredth.

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.6.1 Given a mathematical or real-world context, when suitable factorization is possible, solve one-variable polynomial equations of degree 3 or higher over real and complex number systems.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve polynomial equations of degree 3 or higher over real and complex number systems. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, solve one-variable polynomial equations of degree 3 or higher over real and complex number systems. 	<p>A storage container is shaped like a rectangular prism with length $x + 4$ feet, width x feet, and depth $x - 2$ feet. The volume of the container is 12 cubic feet. Find the dimensions of the container.</p>

MA.912.AR.6.1 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given a mathematical context, solve one-variable polynomial equations of degree 3 or higher over real and complex number systems.	<p>Solve the equation.</p> <p>a. $x^4 + 7x^2 - 144 = 0$</p> <p>b. $8x^5 + 12x^4 + 4x^3 + 6x^2 = 0$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Solve quadratic equations over real and complex number systems.	<p>Solve the equation.</p> <p>a. $x^2 - 4x - 12 = 0$</p> <p>b. $x^2 + 4x = 2$</p> <p>c. $x^2 + 6x + 12 = 0$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

H MA.912.AR.6.2 Explain and apply the Remainder Theorem to solve mathematical and real-world problems.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to use the Remainder Theorem to solve problems. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Explain and apply the Remainder Theorem to solve real-world problems. 	<p>A player's score s in each level of a game is determined by her time t (in seconds) and evaluating the function below.</p> $s(t) = 0.4t^4 + 0.2t^3 + 0.1t^2 + 0.3t - 1$ <p>Use the Remainder Theorem to find a player's score when she has a time of 12 seconds. Explain your reasoning.</p>

MA.912.AR.6.2 (continued) **H**

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Explain and apply the Remainder Theorem to solve mathematical problems.	<p>a. Let $f(x) = x^3 + 2x^2 - 5x + 4$. Divide $f(x)$ by $x - 2$.</p> <p>b. Explain why the remainder is equal to $f(2)$.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Divide polynomials.	<p>Divide.</p> $(x^3 - 5x^2 + 7) \div (x - 4)$

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.6.5 Sketch a rough graph of a polynomial function of degree 3 or higher using zeros, multiplicity and knowledge of end behavior.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to graph a polynomial function. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Sketch a rough graph of a polynomial function of degree 3 or higher using zeros, multiplicity, and knowledge of end behavior. 	<p>Graph the polynomial function.</p> $f(x) = \frac{1}{8}x^4 - \frac{1}{8}x^3 - \frac{1}{2}x^2 + 2$

MA.912.AR.6.5 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given a graph of a polynomial function, describe the end behavior.	<p>Describe the end behavior of each function.</p> <p>a. $-x^3 - 5x^2 + 3x + 9$</p> <p>b. $6x^6 + 3x^5 - 12x^4 - 9x^3$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Graph a quadratic function.	<p>Graph the quadratic function.</p> $f(x) = 2(x - 4)(x + 5)$

**Evidence-
Based Scale
Worksheets****Algebraic Reasoning****MA.912.AR.7.1** Solve one-variable radical equations. Interpret solutions as viable in terms of context and identify any extraneous solutions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve one-variable radical equations. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve one-variable radical equations. Interpret solutions as viable in terms of context and identify any extraneous solutions. 	<p>Solve the equation.</p> <p>a. $\sqrt{6x - 2} + 3 = 7$</p> <p>b. $\sqrt[3]{3x - 8} = \sqrt[3]{x + 4}$</p> <p>c. $\sqrt{x + 1} + \sqrt{2x + 3} = 1$</p>

MA.912.AR.7.1 (continued)

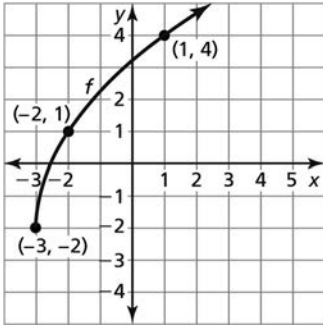
	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Simplify algebraic expressions involving radicals.	<p>Simplify the expression.</p> <p>a. $\sqrt[4]{32z^4}$</p> <p>b. $\sqrt[5]{\frac{x^{10}y^6}{243}}$</p> <p>c. $\sqrt[7]{\frac{m^{-2}p^2}{m^5p^{-5}}}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Simplify numerical expressions involving radicals.	<p>Simplify the expression.</p> <p>a. $\sqrt{40}$</p> <p>b. $\sqrt[3]{\frac{-27}{64}}$</p> <p>c. $\frac{\sqrt{6}}{\sqrt{14}}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.7.2 Given a table, equation or written description of a square root or cube root function, graph that function and determine its key features.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a square root or cube root function given by a graph. 	<p>Write a function that represents the graph.</p> 
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a table, equation, or written description of a square root or cube root function, graph that function and determine its key features. 	<p>Graph each function. Identify the domain and range, intercepts, intervals where the function is increasing or decreasing, and intervals when the function is positive or negative. Then describe the end behavior of the function.</p> <p>a. $f(x) = -\sqrt{x + 3} - 2$</p> <p>b. $g(x) = 2\sqrt[3]{x - 1}$</p>

MA.912.AR.7.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Graph the parent square root and cube root functions and describe the key features.	<p>Graph each function. Identify the domain and range, intercepts, intervals where the function is increasing or decreasing, and intervals when the function is positive or negative. Then describe the end behavior of the function.</p> <p>a. $f(x) = \sqrt{x}$</p> <p>b. $g(x) = \sqrt[3]{x}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Evaluate square root and cube root functions.	<p>Evaluate each function when $x = 5$.</p> <p>a. $f(x) = \sqrt{x + 11} - 3$</p> <p>b. $g(x) = \sqrt[3]{7 - 3x}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.7.3 Solve and graph mathematical and real-world problems that are modeled with square root or cube root functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve and graph mathematical and real-world problems modeled with logarithmic functions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph real-world problems that are modeled with square root or cube root functions. Interpret key features and determine constraints of a square root or cube root function in terms of the context. 	<p>The function $y = 4\sqrt{x + 22.4} - 18.4$ can be used to find the maximum safe speed y (in miles per hour) that a car can drive based on the available stopping distance x (in feet).</p> <p>a. Find the maximum speed when the available distance is 200 feet.</p> <p>b. What is the x-intercept of the graph of the function? Is this value useful in the context of the problem? Explain.</p> <p>c. What is a reasonable domain for the function in terms of the context?</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.8.1 Write and solve one-variable rational equations. Interpret solutions as viable in terms of the context and identify any extraneous solutions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve one-variable rational equations. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Write and solve one-variable rational equations. Interpret solutions as viable in terms of the context and identify any extraneous solutions. 	<p>Melchior is composed of 25% nickel and 75% copper by weight. You have 500 ounces of an alloy that is 50% nickel and 50% copper by weight. How many ounces of copper should you combine with this alloy to create melchior?</p>

MA.912.AR.8.1 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">• Solve one-variable rational equations. Interpret solutions as viable in terms of the context and identify any extraneous solutions.	<p>Solve the equation.</p> <p>a. $1 - \frac{2}{x} = \frac{8}{x^2}$</p> <p>b. $\frac{x}{x+4} = \frac{32}{x^2-16} + 3$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">• Solve equations involving fractions.	<p>Solve the equation.</p> <p>a. $\frac{3}{7}x + 4 = \frac{17}{7}x - 8$</p> <p>b. $\frac{x}{8} + \frac{2}{3} = \frac{x}{6} + \frac{3}{4}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.8.2 Given a table, equation or written description of a rational function, graph that function and determine its key features.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence										
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to graph a rational function. 											
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a table, equation, or written description of a rational function, graph that function and determine its key features. 	<p>Graph each function and its asymptotes. Find the domain and range, intercepts, intervals where the function is increasing or decreasing, and intervals where the function is positive or negative. Then describe the end behavior.</p> <p>a. $f(x) = \frac{x - 4}{x + 2}$</p> <p>b. The table represents a rational function g of the form $g(x) = \frac{a}{x}$.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>-1</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>g(x)</td> <td>-4</td> <td>4</td> <td>2</td> <td>$\frac{4}{3}$</td> </tr> </table> <p>c. A rational function h is of the form $h(x) = \frac{a}{x - h} + k$. The asymptotes of h intersect at $(-2, -2)$, and the point $(1, 1)$ is on the graph of h.</p>	x	-1	1	2	3	g(x)	-4	4	2	$\frac{4}{3}$
x	-1	1	2	3								
g(x)	-4	4	2	$\frac{4}{3}$								

MA.912.AR.8.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Find the domain of rational functions.	<p>Find the domain of each rational function.</p> <p>a. $f(x) = \frac{2}{x}$</p> <p>b. $g(x) = \frac{4}{x - 5}$</p> <p>c. $h(x) = \frac{x + 1}{x^2 - 9}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Evaluate rational functions.	<p>Evaluate the rational function when $x = -3, 2,$ and 5.</p> <p>$f(x) = \frac{x - 2}{x + 5}$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.8.3 Solve and graph mathematical and real-world problems that are modeled with rational functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to solve and graph mathematical and real-world problems modeled with rational functions. Write a rational function to model mathematical and real-world problems. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve and graph real-world problems that are modeled with rational functions. Interpret key features and determine constraints of rational functions in terms of the context. 	<p>A restaurant is considering adding a new meal to its menu. The price the restaurant needs to charge to make a profit on the meal is modeled by the function $p(s) = \frac{10s + 70}{s + 3}$, where s is the average number of times the meal is ordered each day.</p> <p>a. Graph the function. Describe a reasonable domain and range.</p> <p>b. The restaurant will round the meal price suggested by the model to the nearest dollar. What is the least price the restaurant will charge for the meal? What is the least value of s for which they will charge that price? Explain.</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.9.2 Given a mathematical or real-world context, solve a system consisting of a two-variable linear equation and a non-linear equation algebraically or graphically.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved using a system consisting of a two-variable linear equation and a non-linear equation algebraically or graphically. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, solve a system consisting of a two-variable linear equation and a non-linear equation algebraically or graphically. 	<p>An elevator technician working at the top of an elevator shaft accidentally drops a wrench. The height (in feet) of the wrench after t seconds is represented by the function w.</p> $w(t) = 16t^2 + 200$ <p>At the same time the wrench is dropped, an elevator on a lower floor begins to descend at a constant rate of 2 feet per second. The top of the elevator car starts at a height of 50 feet. After how many seconds does the wrench hit the top of the elevator?</p>

MA.912.AR.9.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given a mathematical context, solve a system consisting of a two-variable linear equation and a non-linear equation algebraically or graphically.	<p>Solve the system of equations.</p> $y = (x - 3)^2 + 1$ $2x - y = 2$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Identify whether a point is a solution of a system of equations.	<p>Tell whether the given point is a solution of the system of equations.</p> $y = (x - 1)^2 - 4$ $x - 2y = 9$ <p>a. (4, 5)</p> <p>b. (1, -4)</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.9.3 Given a mathematical or real-world context, solve a system of two-variable linear or non-linear equations algebraically or graphically.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem that can be solved using a system of two-variable linear or non-linear equations algebraically or graphically. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, solve a system consisting of two-variable linear or non-linear equations algebraically or graphically. 	<p>You are doing a project for a geography class where you use a drone to take aerial photos that you will combine to form a map of the area. Each equation in the system below represents the path of one flight of the drone, where x represents its distance (in miles) east (positive) or west (negative) of your school, and y represents its distance (in miles) north (positive) or south (negative) of your school.</p> $y = -(x - 1)^2 + 4$ $y = x^2 + 3$ <p>In order to complete your map, you must determine where the photos you took overlap. Find the points that represent where the drone's paths intersect.</p>

MA.912.AR.9.3 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Given a mathematical context, solve a system consisting of two-variable linear or non-linear equations algebraically or graphically. 	<p>Solve the system of equations.</p> $3x + 2y = 4$ $y = 0.25x^2 + x + 6$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify whether or not a point is a solution of a system of equations. 	<p>Tell whether each point is a solution of the system of equations.</p> $y = (x - 2)^2 - 3$ $y = -x^2 + 1$ <p>a. (0, 1)</p> <p>b. (2, -3)</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.9.5 Graph the solution set of a system of two-variable inequalities.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to graph the solution set of a system of two-variable inequalities. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Graph the solution set of a system of two-variable inequalities. 	<p>Graph the system of inequalities.</p> $x + 2y < 6$ $y \geq x^2 - 3$

Evidence-Based Scale Worksheets

Algebraic Reasoning

MA.912.AR.9.7 Given a real-world context, represent constraints as systems of linear and non-linear equations or inequalities. Interpret solutions to problems as viable or non-viable options.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Given a system of linear equations, determine an optimal solution. 	<p>Find the maximum value of $2x - 3y$ when x and y are subject to the following constraints.</p> $2 \leq x \leq 7$ $y \geq 1$ $(x - 4)^2 + y \leq 10$
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, represent constraints as systems of linear and non-linear equations or inequalities. Interpret solutions to systems as viable or non-viable options. 	<p>A woodworking shop makes and sells chairs and tables. When making only chairs, the shop can produce 40 each day. On a day when the shop makes tables, the number of chairs they make that day is reduced by the square of the number of tables made. A maximum of 8 tables can be produced per day.</p> <p>a. Write a system of inequalities showing the possible number of chairs c and tables t that the shop can produce each day.</p> <p>b. Is it possible for the shop to produce 15 chairs and 7 tables? Explain.</p>

MA.912.AR.9.7 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Identify a possible solution to a system of linear inequalities. 	<p>The possible numbers of buses x and cars y that can park in a lot is represented by this system of inequalities.</p> $x \geq 0$ $y \geq 0$ $5x + y \leq 100$ <p>Identify a possible number of buses in the parking lot when there are 46 cars parked in the lot.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Determine whether a point is in the solution set of a system of inequalities. 	<p>Determine whether each point is in the solution set of the system of inequalities.</p> $2 \leq x \leq 5$ $y \geq 0$ $x + 2y \leq 10$ <p>a. $(3, 2)$</p> <p>b. $(4, 3)$</p> <p>c. $(5, 3)$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

H MA.912.AR.9.10 Solve and graph mathematical and real-world problems that are modeled with piecewise functions. Interpret key features and determine constraints in terms of the context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a piecewise function to model a real-world problem. 	<p>The cost to park in a downtown garage is \$12 for the first 3 hours. To park from 3 to 6 hours, the cost is \$4 per hour. To park from 6 to 12 hours, the cost is \$24. Parking beyond 12 hours is not allowed. Write a piecewise function that represents the parking costs.</p>
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve real-world problems modeled with piecewise functions. Interpret key features and determine constraints of a piecewise function in terms of the context. 	<p>During an afternoon workout, Newton runs at a speed of 6 miles per hour, then walks home at a speed of 4 miles per hour. Once he arrives home, he stops. His distance from home is given by the function f, where t is measured in hours.</p> $f(t) = \begin{cases} 6t, & 0 < t \leq a \\ \frac{10}{3} - 4t, & a < t \leq b \end{cases}$ <p>a. Find the values of a and b.</p> <p>b. What was the duration of Newton's workout in minutes?</p> <p>c. What was the total distance (running and walking) for the workout?</p>

MA.912.AR.9.10 (continued) **H**

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Graph a piecewise function.	<p>Graph the function.</p> $f(x) = \begin{cases} x + 3, & x < 1 \\ -x + 2, & x \geq 1 \end{cases}$
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Evaluate piecewise functions.	<p>Evaluate $f(x) = \begin{cases} 2x, & x \leq 5 \\ x + 3, & x > 5 \end{cases}$ when $x = 2, 5,$ and $8.$</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

H MA.912.AR.10.1 Given a mathematical or real-world context, write and solve problems involving arithmetic sequences.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else how to write an arithmetic sequence. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Given a real-world context, write and solve problems involving arithmetic sequences. 	<p>You open a savings account with \$15 and deposit \$10 into it each week. Write a function that represents the balance (in dollars) of the account in the nth week. Then find the balance of the account in the 24th week.</p>

MA.912.AR.10.1 (continued) H

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Given a mathematical context, write and solve problems involving arithmetic sequences. 	<p>Solve the problem.</p> <p>a. The first term in a sequence is 5, and the common difference between terms is 6. What is the 21st term in the sequence?</p> <p>b. Write an equation for the nth term of an arithmetic sequence where $a_{10} = 45$ and $a_{18} = 77$.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Find the next terms in an arithmetic sequence. 	<p>Find the next two terms in the sequence.</p> <p>a. 4, 7, 10, 13, 16, . . .</p> <p>b. 41, 37, 33, 29, 25, . . .</p>

Evidence-Based Scale Worksheets

Algebraic Reasoning

H MA.912.AR.10.2 Given a mathematical or real-world context, write and solve problems involving geometric sequences.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to write a geometric sequence. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world context, write and solve problems involving geometric sequences. 	<p>A scientist observes the volume of a solution over time, and observes that the volume halves each hour. The solution has a volume of 60 liters at the beginning of the 1st hour. Write a function that represents the volume (in liters) of solution remaining at the beginning of the nth hour. Then find the volume of solution at the beginning of the 6th hour.</p>

MA.912.AR.10.2 (continued) H

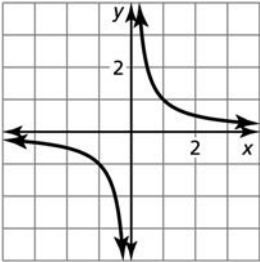
	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Given a mathematical context, write and solve problems involving geometric sequences. Solve problems involving geometric sequences. 	<p>a. The first term in a sequence is 1024, and the common ratio between terms is $\frac{3}{4}$. What is the 7th term in the sequence?</p> <p>b. Write an equation for the nth term of a geometric sequence where $a_6 = 112$ and $a_8 = 448$.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Find the next terms in a geometric sequence. 	<p>Find the next two terms in the sequence.</p> <p>a. 5, 10, 20, 40, 80, . . .</p> <p>b. 256, 128, 64, 32, . . .</p>

Evidence-Based Scale Worksheets

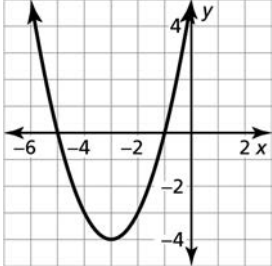
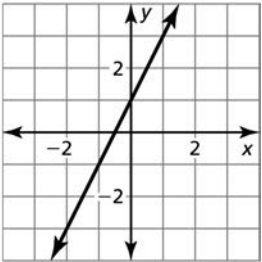
Functions

MA.912.F.1.1 Given an equation or graph that defines a function, determine the function type. Given an input-output table, determine a function type that could represent it.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence														
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to determine a function type from an equation graph, or table. 															
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given an equation or graph that defines a function, determine the function type. Given an input-output table, determine a function type that could represent it. 	<p>Determine a function type that could represent the input-output table or equation.</p> <p>a.</p> <table border="1" data-bbox="903 1236 1471 1375"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>-27</td> <td>-8</td> <td>-1</td> <td>0</td> <td>1</td> <td>8</td> </tr> </table> <p>b. $y = 2^{x-4}$</p> <p>c.</p> 	x	-3	-2	-1	0	1	2	y	-27	-8	-1	0	1	8
x	-3	-2	-1	0	1	2										
y	-27	-8	-1	0	1	8										

MA.912.F.1.1 (continued)

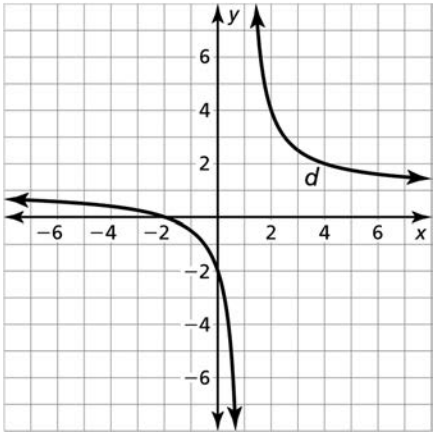
	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Given a function, identify its function family. 	<p>Identify the function family to which each function belongs.</p> <p>a.</p>  <p>b.</p> 
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Define parent function. 	<p>Define parent function.</p>

Evidence-Based Scale Worksheets

Functions

MA.912.F.1.7 Compare key features of two functions each represented algebraically, graphically, in tables or written descriptions.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence												
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to identify and compare key features of two functions that are represented in different forms. 													
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Compare key features of two functions each represented algebraically, graphically, in tables, or with written descriptions. 	<p>a. Compare the asymptotes and end behavior of d and f.</p>  <p>$f(x) = \frac{x - 2}{x - 1}$</p> <p>b. Compare the intervals where g and h are increasing, decreasing, positive, and negative.</p> <p>$g(x) = (x + 2)^2 - 4$</p> <table border="1" data-bbox="900 1629 1359 1738"> <tbody> <tr> <td>x</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>h(x)</td> <td>3</td> <td>0</td> <td>-5</td> <td>-12</td> <td>-21</td> </tr> </tbody> </table>	x	-1	0	1	2	3	h(x)	3	0	-5	-12	-21
x	-1	0	1	2	3									
h(x)	3	0	-5	-12	-21									

MA.912.F.1.7 (continued)

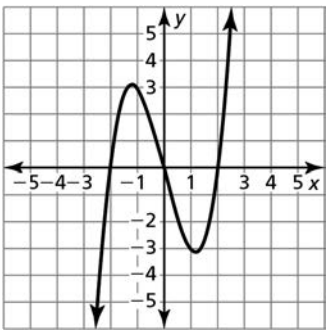
	Description	Evidence																												
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Compare key features of two functions represented in the same form. 	<p>Compare the features of the two functions.</p> <table border="1" data-bbox="700 354 1278 537"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{2}$</td> <td>1</td> <td>2</td> <td>4</td> <td>8</td> </tr> </table> <table border="1" data-bbox="700 606 1278 789"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>y</td> <td>$\frac{1}{16}$</td> <td>$\frac{1}{8}$</td> <td>$\frac{1}{4}$</td> <td>$\frac{1}{2}$</td> <td>1</td> <td>2</td> </tr> </table> <p>a. intercepts</p> <p>b. asymptotes</p> <p>c. positive/negative intervals</p> <p>d. increasing/decreasing intervals</p>	x	-3	-2	-1	0	1	2	y	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8	x	-3	-2	-1	0	1	2	y	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2
x	-3	-2	-1	0	1	2																								
y	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8																								
x	-3	-2	-1	0	1	2																								
y	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2																								
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify key features of a function. 	<p>Find the domain and range. Identify the intercepts, intervals when the function is positive or negative, and intervals when the function is increasing or decreasing.</p> $y = \frac{5}{3}x - 4$																												

Evidence-Based Scale Worksheets

Functions

MA.912.F.1.9 Determine whether a function is even, odd or neither when represented algebraically, graphically or in a table.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to identify whether a function is even, odd, or neither. 																	
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Determine whether a function represented graphically, algebraically, or in a table is even, odd, or neither. 	<p>Determine whether each function is even, odd, or neither.</p> <p>a. $f(x) = \frac{x}{x + 4}$</p> <p>b. </p> <p>c. <table border="1" data-bbox="903 1430 1465 1570"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>y</td> <td>7</td> <td>3</td> <td>1</td> <td>0</td> <td>1</td> <td>3</td> <td>7</td> </tr> </table></p>	x	-3	-2	-1	0	1	2	3	y	7	3	1	0	1	3	7
x	-3	-2	-1	0	1	2	3											
y	7	3	1	0	1	3	7											

MA.912.F.1.9 (continued)

	Description	Evidence
2	I understand some parts, but not the entire standard. <ul style="list-style-type: none">Identify points on the graphs of even and odd functions.	Each point lies on the graph of a function of the type given. Name another point on the graph of the function. a. $(-4, 5)$, even b. $(2, -3)$, odd
1	I understand the basic skills needed to begin learning this standard. <ul style="list-style-type: none">Define even and odd functions.	a. Define even function. b. Define odd function.

Evidence-Based Scale Worksheets

Functions

MA.912.F.2.2 Identify the effect on the graph of a given function of two or more transformations defined by adding a real number to the x - or y -values or multiplying the x - or y -values by a real number.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to identify the effect of two or more transformations on a given function. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Identify the effect of two transformations on the graph of a given function. 	<p>Describe the transformation of f represented by g.</p> <p>a. $f(x) = 4x^2 + 5$; $g(x) = 4f(x + 3)$</p> <p>b. $f(x) = 3x^3 + 2x$; $g(x) = f(2x) - 5$</p> <p>c. $f(x) = \frac{x}{x - 2}$; $g(x) = -0.5f(x - 2)$</p>

MA.912.F.2.2 (continued)

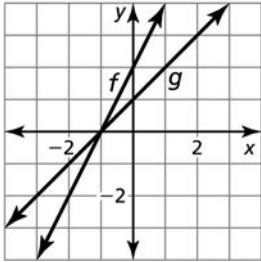
	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Identify the effect of a single transformation on the graph of a given function. 	<p>Describe the transformation of f represented by g.</p> <p>a. $f(x) = 5x + 1; g(x) = f(x + 6)$</p> <p>b. $f(x) = \frac{1}{2}x + 3; g(x) = -5f(x)$</p> <p>c. $f(x) = -2x; g(x) = f(x) - 3$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Identify types of coordinate transformations. 	<p>Identify each type of transformation.</p> <p>a. $(x, y) \rightarrow (x + a, y + b)$</p> <p>b. $(x, y) \rightarrow (ax, ay)$</p>

Evidence-Based Scale Worksheets

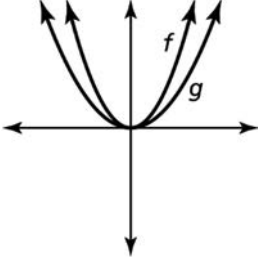
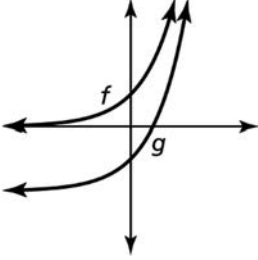
Functions

MA.912.F.2.3 Given the graph or table of $f(x)$ and the graph or table of $f(x) + k$, $kf(x)$, $f(kx)$ and $f(x + k)$, state the type of transformation and find the value of the real number k .

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																																
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to identify translations, stretches, and shrinks of functions given graphs or tables. 																																	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Identify translations, stretches, and shrinks of functions given graphs or tables. 	<p>Describe the transformation from f to g.</p> <p>a.</p> <table border="1" data-bbox="903 800 1469 940"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>f(x)</td> <td>4</td> <td>8</td> <td>9</td> <td>10</td> <td>9</td> <td>8</td> <td>4</td> </tr> </table> <table border="1" data-bbox="903 968 1469 1108"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>g(x)</td> <td>1</td> <td>5</td> <td>6</td> <td>7</td> <td>6</td> <td>5</td> <td>1</td> </tr> </table> <p>b.</p> 	x	-3	-2	-1	0	1	2	3	f(x)	4	8	9	10	9	8	4	x	-3	-2	-1	0	1	2	3	g(x)	1	5	6	7	6	5	1
x	-3	-2	-1	0	1	2	3																											
f(x)	4	8	9	10	9	8	4																											
x	-3	-2	-1	0	1	2	3																											
g(x)	1	5	6	7	6	5	1																											

MA.912.F.2.3 (continued)

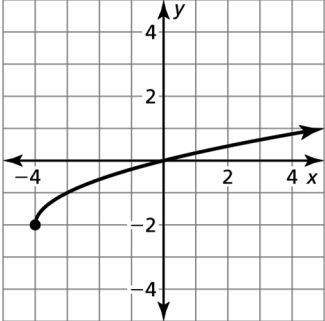
	Description	Evidence
<p>2</p>	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Identify transformations based on appearance. 	<p>Describe the transformation from f to g.</p> <p>a. </p> <p>b. </p>
<p>1</p>	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify types of transformations. 	<p>Identify each type of transformation.</p> <p>a. $f(x) \rightarrow kf(x)$</p> <p>b. $f(x) \rightarrow f(x + k)$</p> <p>c. $f(x) \rightarrow f(x) + k$</p>

Evidence-Based Scale Worksheets

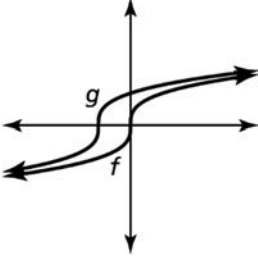
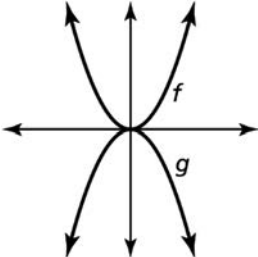
Functions

MA.912.F.2.5 Given a table, equation or graph that represents a function, create a corresponding table, equation or graph of the transformed function defined by adding a real number to the x - or y -values or by multiplying the x - or y -values by a real number.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a real-world problem that involves finding a transformed function represented as a table, equation, or graph. 																	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Given a table, equation, or graph that represents a function, create a corresponding table, equation, or graph of the transformed function defined by adding a real number to the x- or y-values or by multiplying the x- or y-values by a real number. 	<p>For each table, graph, or equation, create a table, graph or equation representing the given transformation of the function.</p> <p>a. horizontal translation 2 units left</p> <table border="1" data-bbox="834 911 1445 1062"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>$f(x)$</td> <td>-26</td> <td>-7</td> <td>0</td> <td>1</td> <td>4</td> <td>9</td> <td>28</td> </tr> </table> <p>b. vertical stretch by a factor of 2</p>  <p>c. horizontal shrink by a factor of 0.25</p> $y = (x + 4)^2 - 3$	x	-3	-2	-1	0	1	2	3	$f(x)$	-26	-7	0	1	4	9	28
x	-3	-2	-1	0	1	2	3											
$f(x)$	-26	-7	0	1	4	9	28											

MA.912.F.2.5 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Identify transformations based on appearance. 	<p>Describe the transformation from f to g.</p> <p>a.</p>  <p>b.</p> 
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Identify transformations. 	<p>Identify the transformation.</p> <p>a. $f(x) \rightarrow f(7x)$</p> <p>b. $f(x) \rightarrow f(x) - 2$</p> <p>c. $f(x) \rightarrow f(x + 5)$</p>

Evidence-Based Scale Worksheets

Functions

MA.912.F.3.2 Given a mathematical or real-world context, combine two or more functions, limited to linear, quadratic, exponential and polynomial, using arithmetic operations. When appropriate, include domain restrictions for the new function.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a real-world problem that involves combining functions using arithmetic operations. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Given a real-world context, combine two or more functions using arithmetic operations. 	<p>a. For a white rhino, heart rate h (in beats per minute) and life span s (in minutes) are related to body mass b (in kilograms) by the functions $h(b) = 242b^{-0.35}$ and $s(b) = (5 \times 10^5)b^{0.3}$. Write the function $G(b) = h(b)s(b)$. What does $G(b)$ represent?</p> <p>b. The total number of distinct people who have been employed at an office x years after opening is $f(x) = 1000(1.03)^x$. The office loses 20 employees each year, which is represented by the function $g(x) = -20x$. Write the function $h(x) = f(x) + g(x)$. What does $h(x)$ represent?</p>

MA.912.F.3.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Given a mathematical context, combine two or more functions using arithmetic operations. 	<p>Given $f(x) = x^2 - 1$ and $g(x) = 2^x - 1$.</p> <p>a. Find $f(x)g(x)$.</p> <p>b. Find $f(x) + g(x)$.</p> <p>c. Find $f(x) - g(x)$.</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Perform arithmetic operations using values of functions. 	<p>Perform each indicated operation when $p(3) = 4$ and $q(3) = -2$.</p> <p>a. $p(3) + q(3)$ b. $q(3) - p(3)$</p> <p>c. $q(3) \cdot p(3)$ d. $p(3) \div q(3)$</p>

**Evidence-
Based Scale
Worksheets**

Functions

MA.912.F.3.4 Represent the composition of two functions algebraically or in a table. Determine the domain and range of the composite function.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a real-life problem that can be represented as a composition of two functions. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Represent the composition of two functions. Determine the domain and range of the composite function. 	<p>Find each composition. Then determine the domain and range of the composite function.</p> $j(x) = x + 2$ $k(x) = e^x - 3$ $m(x) = \ln(5x)$ <p>a. $j(k(x))$</p> <p>b. $k(m(x))$</p>

MA.912.F.3.4 (continued)

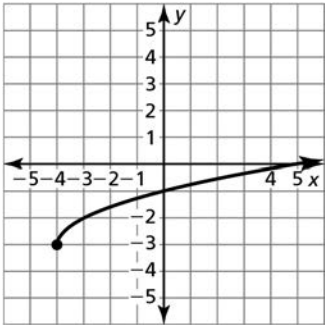
	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Evaluate compositions of functions.	<p>Evaluate each composition of the following functions.</p> $f(x) = x - 7$ $g(x) = e^{x-1}$ $h(x) = \ln(x - 5)$ <p>a. $g(f(8))$</p> <p>b. $g(h(6))$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Define composition.	<p>Define composition.</p>

Evidence-Based Scale Worksheets

Functions

MA.912.F.3.6 Determine whether an inverse function exists by analyzing tables, graphs, and equations.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to determine if a function's inverse is also a function. 																	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Determine whether an inverse function exists by analyzing tables, graphs, and equations. 	<p>Determine whether the function is invertible.</p> <p>a. $y = x^2 - 4$</p> <p>b.</p> <table border="1" data-bbox="895 1075 1453 1213"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>f(x)</td> <td>-26</td> <td>-7</td> <td>0</td> <td>1</td> <td>4</td> <td>9</td> <td>28</td> </tr> </table> <p>c.</p> 	x	-3	-2	-1	0	1	2	3	f(x)	-26	-7	0	1	4	9	28
x	-3	-2	-1	0	1	2	3											
f(x)	-26	-7	0	1	4	9	28											

MA.912.F.3.6 (continued)

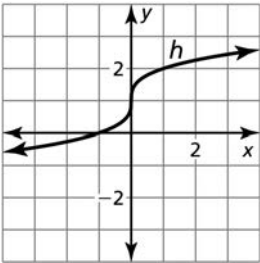
	Description	Evidence																																																
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Determine whether pairs of functions are inverses. 	<p>Determine whether each pair of functions f and g are inverses.</p> <p>a.</p> <table border="1" data-bbox="774 380 1289 485"> <tr> <td>x</td> <td>-2</td> <td>0</td> <td>2</td> <td>4</td> <td>6</td> </tr> <tr> <td>$f(x)$</td> <td>-8</td> <td>-1</td> <td>6</td> <td>13</td> <td>20</td> </tr> </table> <table border="1" data-bbox="774 512 1289 617"> <tr> <td>x</td> <td>-2</td> <td>0</td> <td>2</td> <td>4</td> <td>6</td> </tr> <tr> <td>$g(x)$</td> <td>8</td> <td>1</td> <td>-6</td> <td>-13</td> <td>-20</td> </tr> </table> <p>b.</p> <table border="1" data-bbox="774 800 1179 936"> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>$f(x)$</td> <td>-1</td> <td>2</td> <td>5</td> <td>8</td> <td>11</td> </tr> </table> <table border="1" data-bbox="774 968 1179 1104"> <tr> <td>x</td> <td>-1</td> <td>2</td> <td>5</td> <td>8</td> <td>11</td> </tr> <tr> <td>$g(x)$</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> </tr> </table>	x	-2	0	2	4	6	$f(x)$	-8	-1	6	13	20	x	-2	0	2	4	6	$g(x)$	8	1	-6	-13	-20	x	-2	-1	0	1	2	$f(x)$	-1	2	5	8	11	x	-1	2	5	8	11	$g(x)$	-2	-1	0	1	2
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x	-1	2	5	8	11																																													
$g(x)$	-2	-1	0	1	2																																													
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Define inverse functions. 	<p>a. Define inverse functions.</p>																																																

Evidence-Based Scale Worksheets

Functions

MA.912.F.3.7 Represent the inverse function algebraically, graphically or in a table. Use composition of functions to verify that one function is the inverse of the other.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																								
<p>4</p>	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a word problem that involves representing the inverse of a function and verifying that the functions are inverses. 																									
<p>3</p>	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Represent the inverse of a function algebraically, graphically, or in a table. 	<p>a. Find the inverse of f.</p> $f(x) = \frac{4 - x}{2}$ <p>b. Complete the table for the inverse of g.</p> <table border="1" data-bbox="895 1182 1410 1287"> <tr> <td>x</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>$g(x)$</td> <td>12</td> <td>32</td> <td>-2</td> <td>6</td> <td>3</td> </tr> </table> <table border="1" data-bbox="895 1320 1437 1428"> <tr> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>$g^{-1}(x)$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>c. Graph the inverse of h.</p> 	x	2	3	4	5	6	$g(x)$	12	32	-2	6	3	x						$g^{-1}(x)$					
x	2	3	4	5	6																					
$g(x)$	12	32	-2	6	3																					
x																										
$g^{-1}(x)$																										

MA.912.F.3.7 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Verify whether two functions are inverses. 	<p>Determine whether each pair of functions are inverse functions.</p> <p>a. $f(x) = 4x + 1, g(x) = \frac{x + 1}{4}$</p> <p>b. $f(x) = 3x^3 + 3, g(x) = \sqrt[3]{\frac{x - 3}{3}}$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Find the composition of two functions. 	<p>Find each composite function when $f(x) = \frac{x}{2}$ and $g(x) = -2x + 7$.</p> <p>a. $f(g(x))$</p> <p>b. $g(f(x))$</p>

Evidence-Based Scale Worksheets

Financial Literacy

MA.912.FL.3.1 Compare simple, compound and continuously compounded interest over time.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to compare different types of interest. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Compare simple, compound, and continuously compounded interest over time. 	<p>You deposit \$8000 in a savings account. Find the total amount (to the nearest dollar) in the account after 5 years for each type of interest.</p> <p>a. 4.3% simple interest</p> <p>b. 4% interest compounded monthly</p> <p>c. 4% interest compounded continuously</p> <p>Which type of interest resulted in the account with the greatest amount of money?</p>

Evidence-Based Scale Worksheets

Financial Literacy

MA.912.FL.3.2 Solve real-world problems involving simple, compound and continuously compounded interest.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Write a word problem involving multiple types of interest. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Solve real-world problems involving simple, compound, and continuously compounded interest. 	<p>For each type of interest, find the principal (to the nearest dollar) that results in a savings account with a value of \$10,000 after 8 years.</p> <p>a. 6% simple interest</p> <p>b. 2% interest compounded quarterly</p> <p>c. 8% interest compounded continuously</p>

MA.912.FL.3.2 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Solve mathematical problems involving simple, compound, and continuously compounded interest. 	<p>For the given annual interest rate and type of interest, find the value, to the nearest cent, of an account with a principal of \$1000 after 1 year.</p> <ul style="list-style-type: none"> a. 5% simple interest b. 6% interest compounded quarterly c. 4% interest compounded continuously
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Write the formulas for simple, compound, and continuously compounded interest. 	<p>Write the formula for each type of interest.</p> <ul style="list-style-type: none"> a. simple interest b. compound interest c. continuously compounded interest

Evidence-Based Scale Worksheets

Financial Literacy

MA.912.FL.3.4 Explain the relationship between simple interest and linear growth. Explain the relationship between compound interest and exponential growth and the relationship between continuously compounded interest and exponential growth.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Teach someone else the relationship between different types of interest and different type of growth. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Explain the relationship between simple interest and linear growth. • Explain the relationship between compound interest and exponential growth • Explain the relationship between continuously compounded interest and exponential growth. 	<p>a. What is the relationship between simple interest and linear growth?</p> <p>b. What is the relationship between compound interest and exponential growth and between continuously compounded interest and exponential growth?</p>

MA.912.FL.3.4 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Identify whether a situation represents linear growth or exponential growth. 	<p>Identify whether each scenario represents linear or exponential growth.</p> <ul style="list-style-type: none"> a. \$1000 is invested in an account that earns 3% interest compounded continuously b. a bond purchased for \$800 pays 4.2% simple interest c. a savings account earns 1.5% interest compounded daily
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Define linear growth and exponential growth. 	<ul style="list-style-type: none"> a. Define linear growth. b. Define exponential growth.

Evidence-Based Scale Worksheets

Data Analysis and Probability

MA.912.DP.2.8 Fit a quadratic function to bivariate numerical data that suggests a quadratic association and interpret any intercepts or the vertex of the model. Use the model to solve real-world problems in terms of the context of the data.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																								
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a real-world problem that can be solved by fitting a quadratic function to a data set. 																									
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Fit a quadratic function to bivariate numerical data that suggests a quadratic association. • Interpret any intercepts or the vertex of the model. • Use a model to solve real-world problems in terms of the context of the data. 	<p>A ball is thrown from the top of a building. The table shows its height h (in feet) t seconds after it is thrown.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>t</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>$h(t)$</td> <td>150</td> <td>175</td> <td>190</td> <td>200</td> <td>197</td> </tr> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>t</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>$h(t)$</td> <td>180</td> <td>160</td> <td>125</td> <td>71</td> <td>32</td> </tr> </table> <p>a. Write a quadratic function that models the data.</p> <p>b. What height is the ball thrown from? How long is the ball in the air? Explain.</p> <p>c. Identify and interpret the vertex.</p>	t	0	1	2	3	4	$h(t)$	150	175	190	200	197	t	5	6	7	8	9	$h(t)$	180	160	125	71	32
t	0	1	2	3	4																					
$h(t)$	150	175	190	200	197																					
t	5	6	7	8	9																					
$h(t)$	180	160	125	71	32																					

MA.912.DP.2.8 (continued)

	Description	Evidence																								
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Fit a quadratic function to bivariate data that suggests a quadratic association. 	<p>Write a function that models the data.</p> <table border="1" data-bbox="703 359 1182 470"> <tr> <td>x</td> <td>-4</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> </tr> <tr> <td>$g(x)$</td> <td>-92</td> <td>-59</td> <td>-32</td> <td>-11</td> <td>4</td> </tr> </table> <table border="1" data-bbox="703 512 1182 623"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>$g(x)$</td> <td>13</td> <td>16</td> <td>13</td> <td>4</td> <td>-11</td> </tr> </table>	x	-4	-3	-2	-1	0	$g(x)$	-92	-59	-32	-11	4	x	1	2	3	4	5	$g(x)$	13	16	13	4	-11
x	-4	-3	-2	-1	0																					
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x	1	2	3	4	5																					
$g(x)$	13	16	13	4	-11																					
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Given an input-output table, determine whether a quadratic function could represent it. 	<p>Could $h(x)$ be a quadratic function? Explain.</p> <table border="1" data-bbox="703 831 1182 942"> <tr> <td>x</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>$h(x)$</td> <td>23</td> <td>-3</td> <td>-17</td> <td>-19</td> <td>-9</td> </tr> </table> <table border="1" data-bbox="703 984 1182 1096"> <tr> <td>x</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>$h(x)$</td> <td>13</td> <td>47</td> <td>93</td> <td>151</td> <td>221</td> </tr> </table>	x	-1	0	1	2	3	$h(x)$	23	-3	-17	-19	-9	x	4	5	6	7	8	$h(x)$	13	47	93	151	221
x	-1	0	1	2	3																					
$h(x)$	23	-3	-17	-19	-9																					
x	4	5	6	7	8																					
$h(x)$	13	47	93	151	221																					

Evidence-Based Scale Worksheets

Data Analysis and Probability

MA.912.DP.2.9 Fit an exponential function to bivariate numerical data that suggests an exponential association. Use the model to solve real-world problems in terms of the context of the data.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence																								
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a real-world problem that can be solved by fitting an exponential function to a data set. 																									
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Fit an exponential function to bivariate numerical data that suggests an exponential association. • Use the model to solve real-world problems in terms of the context of the data. 	<p>The table shows the median value m (in thousands of dollars) of house s in a community x years after 2010.</p> <table border="1" data-bbox="836 940 1323 1045"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>$m(x)$</td> <td>90</td> <td>94</td> <td>103</td> <td>107</td> <td>118</td> </tr> </table> <table border="1" data-bbox="836 1098 1323 1203"> <tr> <td>x</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>$m(x)$</td> <td>125</td> <td>133</td> <td>142</td> <td>147</td> <td>155</td> </tr> </table> <p>a. Write an exponential function that models the data.</p> <p>b. In what year do you expect the median price to have exceeded \$180,000?</p>	x	0	1	2	3	4	$m(x)$	90	94	103	107	118	x	5	6	7	8	9	$m(x)$	125	133	142	147	155
x	0	1	2	3	4																					
$m(x)$	90	94	103	107	118																					
x	5	6	7	8	9																					
$m(x)$	125	133	142	147	155																					

MA.912.DP.2.9 (continued)

	Description	Evidence																								
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Fit an exponential function to bivariate data that suggests an exponential association. 	<p>Write a function that models the data.</p> <table border="1" style="margin-bottom: 10px;"> <tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td></tr> <tr><td>g(x)</td><td>0</td><td>0.1</td><td>0.6</td><td>20.1</td></tr> </table> <table border="1"> <tr><td>x</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>g(x)</td><td>124.7</td><td>795.5</td><td>6300.2</td><td>125,890.1</td></tr> </table>	x	-2	-1	0	1	g(x)	0	0.1	0.6	20.1	x	2	3	4	5	g(x)	124.7	795.5	6300.2	125,890.1				
x	-2	-1	0	1																						
g(x)	0	0.1	0.6	20.1																						
x	2	3	4	5																						
g(x)	124.7	795.5	6300.2	125,890.1																						
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Given an input-output table, determine whether an exponential function could represent it. 	<p>Could $h(x)$ be an exponential function?</p> <table border="1" style="margin-bottom: 10px;"> <tr><td>x</td><td>-4</td><td>-3</td><td>-2</td><td>-1</td><td>0</td></tr> <tr><td>h(x)</td><td>$\frac{1}{3}$</td><td>1</td><td>3</td><td>9</td><td>27</td></tr> </table> <table border="1"> <tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>h(x)</td><td>81</td><td>243</td><td>729</td><td>2187</td><td>6561</td></tr> </table>	x	-4	-3	-2	-1	0	h(x)	$\frac{1}{3}$	1	3	9	27	x	1	2	3	4	5	h(x)	81	243	729	2187	6561
x	-4	-3	-2	-1	0																					
h(x)	$\frac{1}{3}$	1	3	9	27																					
x	1	2	3	4	5																					
h(x)	81	243	729	2187	6561																					

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.1 Describe events as subsets of a sample space using characteristics, or categories, of the outcomes, or as unions, intersections or complements of other events.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to describe events as subsets of a sample space, or as unions, intersections, or complements of other events. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Describe events as subsets of a sample space using characteristics or categories of the outcomes, Describe events as unions, intersections, or complements of other events. 	<p>You roll a six-sided die and draw a card out of a bag containing a yellow card, orange card, pink card, and blue card. List the sample space for each event.</p> <p>a. You roll a 1 and draw a yellow card.</p> <p>b. You roll a number less than 3 and draw a card that is blue or yellow.</p> <p>c. You roll an odd number and draw a card that is not blue.</p>

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.2 Determine if events A and B are independent by calculating the product of their probabilities.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to determine if two events are independent by calculating the product of their probabilities. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Determine if events A and B are independent by calculating the product of their probabilities. 	<p>a. Two cards in a standard deck of cards are selected at random and replaced. Let B be the event that a black card is chosen, and let F be the event that the number 8 is chosen.</p> <p>Are the events B and F independent? Justify your answer.</p> <p>b. You and a friend are playing a game where you flip a fair coin four times and try to predict the outcome. Let $P(A)$ be the probability that the second flip is heads, and $P(B)$ be the probability that the fourth flip is heads.</p> <p>Are events A and B independent? Justify your answer.</p>

MA.912.DP.4.2 (continued) H

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Identify independent events. 	<p>You are selecting marbles from a bag containing 3 red and 3 blue marbles. Which of the following events are independent?</p> <ul style="list-style-type: none"> a. selecting one red marble, replacing it, and then selecting a blue marble b. selecting one red marble, not replacing it, and then selecting a blue marble c. selecting three blue marbles without replacing the marbles after each selection d. selecting three red marbles and replacing the marbles after each selection
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Determine the probability of a single event. 	<p>You choose a card from a standard deck of cards. What is the probability that you choose a king?</p>

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.3 Calculate the conditional probability of two events and interpret the result in terms of its context.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence									
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> • Create a word problem that involves finding and interpreting a conditional probability. 										
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> • Calculate the conditional probability of two events and interpret the result in terms of its context. 	<p>The results of a survey showing the daily exercise habits of male and female students are shown in the table. Are you more likely to randomly select a female student given that the student exercises every day, or randomly select a student that exercises every day given that the student is male? Explain.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Exercises Every Day</th> <th style="text-align: center;">Does Not Exercise Every Day</th> </tr> </thead> <tbody> <tr> <th style="text-align: center;">Male</th> <td style="text-align: center;">94</td> <td style="text-align: center;">38</td> </tr> <tr> <th style="text-align: center;">Female</th> <td style="text-align: center;">102</td> <td style="text-align: center;">25</td> </tr> </tbody> </table>		Exercises Every Day	Does Not Exercise Every Day	Male	94	38	Female	102	25
	Exercises Every Day	Does Not Exercise Every Day									
Male	94	38									
Female	102	25									

MA.912.DP.4.3 (continued) H

	Description	Evidence									
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> Calculate the conditional probability of two events. 	<p>Use the table to find (a) the probability that a randomly selected junior is not attending the pep rally, and (b) the probability that a randomly selected student that is attending the pep rally is a senior.</p> <table border="1" data-bbox="722 564 1318 798"> <thead> <tr> <th></th> <th>Attending Pep Rally</th> <th>Not Attending Pep Rally</th> </tr> </thead> <tbody> <tr> <th>Junior</th> <td>120</td> <td>35</td> </tr> <tr> <th>Senior</th> <td>142</td> <td>22</td> </tr> </tbody> </table>		Attending Pep Rally	Not Attending Pep Rally	Junior	120	35	Senior	142	22
	Attending Pep Rally	Not Attending Pep Rally									
Junior	120	35									
Senior	142	22									
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> Define conditional probability. 	<p>Define conditional probability.</p>									

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.4 Interpret the independence of two events using conditional probability.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to interpret the independence of two events using conditional probability. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Interpret the independence of two events using conditional probability. 	<p>a. The probability that you sleep less than 8 hours each night is $\frac{3}{10}$. The probability that you sleep less than 8 hours each night and are tired in the morning is $\frac{4}{15}$. If the number of hours you sleep and whether you feel tired in the morning are independent events, find the probability that you are tired in the morning, given that you sleep less than 8 hours each night.</p> <p>b. At a local restaurant, 25% of customers order the chicken sandwich and 10% of customers who order a chicken sandwich also order fries. Are ordering a chicken sandwich and ordering fries independent events?</p>

MA.912.DP.4.4 (continued)

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Find conditional probabilities given whether events are independent.	<p>If events A and B are independent, which statement must be true about the conditional probability of A given B?</p> <p>a. $P(A) > P(B A)$</p> <p>b. $P(A) = P(B A)$</p> <p>c. $P(A) > P(A B)$</p> <p>d. $P(A) = P(A B)$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Define independent events and dependent events.	<p>a. Define independent events.</p> <p>b. Define dependent events.</p>

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.9 Apply the addition and multiplication rules for counting to solve mathematical and real-world problems, including problems involving probability.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Find the probability of more than two overlapping events. Find the probability of more than two disjoint events. 	<p>a. A card is randomly selected from a standard deck of 52 playing cards. What is the probability that it is a diamond, a king, or a 9?</p> <p>b. Three cards are randomly selected from a standard deck of 52 playing cards without replacement. What is the probability that the cards are an even number card, then a jack, then an ace?</p>
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Apply the addition and multiplication rules for counting to solve real-world problems, including problems involving probability. 	<p>a. A card is randomly selected from a standard deck of 52 playing cards. What is the probability that it is a heart or a queen?</p> <p>b. Two cards are randomly selected without replacement. What is the probability that both cards are kings?</p>

MA.912.DP.4.9 (continued) H

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none"> • Apply the addition and multiplication rules for counting to solve mathematical problems, including problems involving probability. 	<p>There are 10 marbles, numbered 1 through 10, in a bag.</p> <ol style="list-style-type: none"> a. What is the probability of selecting an even number or a multiple of 3? b. You select a marble, return it to the bag, and then select a second marble. What is the probability that you selected the same marble twice?
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none"> • Determine the probability of a single event. 	<p>You roll a six-sided die.</p> <ol style="list-style-type: none"> a. What is the probability that you roll an even number? b. What is the probability that you roll a number greater than 4?

Evidence-Based Scale Worksheets

Data Analysis and Probability

H MA.912.DP.4.10 Given a mathematical or real-world situation, calculate the appropriate permutation or combination.

Circle the scale that best demonstrates your knowledge of the standard.

	Description	Evidence
4	<p>I can go beyond the standard.</p> <ul style="list-style-type: none"> Teach someone else how to use permutations and combinations. 	
3	<p>I understand the entire standard.</p> <ul style="list-style-type: none"> Given a real-world situation, calculate the appropriate permutation or combination. 	<p>Determine the number of possible outcomes for each scenario.</p> <p>a. A bag contains 40 tiles labeled 1–40. In how many different orders can 5 different tiles be chosen from the bag?</p> <p>b. A committee including 3 boys and 4 girls is formed from a group of 8 boys and 9 girls. How many different committees can be formed from the group?</p> <p>c. A license plate number is composed of 3 digits from 1–9 and 3 letters of the alphabet except “O”. How many license plates can be formed if neither digits nor letters are repeated?</p>

MA.912.DP.4.10 (continued) **H**

	Description	Evidence
2	<p>I understand some parts, but not the entire standard.</p> <ul style="list-style-type: none">Given a mathematical situation, calculate the appropriate permutation or combination.	<p>Calculate the given permutation or combination.</p> <p>a. ${}_8C_4$</p> <p>b. ${}_{10}P_{10}$</p> <p>c. ${}_7C_5$</p> <p>d. ${}_{12}P_3$</p>
1	<p>I understand the basic skills needed to begin learning this standard.</p> <ul style="list-style-type: none">Calculate factorials.	<p>Evaluate the expression.</p> <p>a. $9!$</p> <p>b. $5!3!$</p> <p>c. $4! + 6!$</p>