Tax Code Update

Practice Problems for

Second Edition

Financial Algebra

ADVANCED ALGEBRA WITH FINANCIAL APPLICATIONS

Robert Gerver | Richard Sgroi

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Advanced Algebra with Financial Applications
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1-1 Discretionary and Essential Expenses

Exercises

1. For most people, the cost of a subscription to streaming music services is definitely a discretionary expense. Marshal researched subscription costs and found the following rates for streaming services:

$10/mo., $6/mo., $33/year, $3/mo., $5/mo., $10/mo., $10/mo., $4/mo., $12/mo., $60/year

a. In order to analyze the data, the subscription rates must cover the same time period. Change the yearly rates to monthly rates.

b. What is the mean monthly subscription fee? Round your answer to the nearest cent.

c. What is the median monthly subscription fee?

d. What is the mode monthly membership fee?

2. Carla is a carpenter. She wants to purchase new high-quality tools for her business. She found the following prices for the exact same set of tools from various sellers:

$6,700 $7,450 $8,000 $7,600 $7,450 $8,200 $7,210

a. What is the mean price? Round your answer to the nearest cent.

b. What is the median price?

c. What is the mode price?

3. According to the Bureau of Economic Analysis, the monthly percentage change of disposable income in the United States over the course of a year from February to February was reported as follows:

0.3% 0% 0.6% 0.5% 0.5% 0.4% 0.3% 0.2% 0.3% 0.2% 0.3% 0.4% 0.2%

a. What was the mean percent change over this period? Round your answer to the nearest hundredth of a percent.

b. What was the median percent change over this period.

c. From January to February of the second year, a 0.2% change in disposable income was reported. If the January amount was 12.43 billion dollars, what would the February amount be? Round your answer to two decimal places.

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4. In their brochure, AutoNation Career School estimated the average discretionary personal expenses for a student attending to be $2,850. Martin is a student and feels that the amount is too high. He polled his co-students and made a list of their actual school year expenses:

$2,500 $2,600 $3,000 $3,200 $2,700 $2,900 $2,850

a. What is the mean of these students' personal expenses? Round your answer to the nearest cent.

b. How does that average compare with the estimate?

c. What would Martin's actual personal expenses for that school year have to be so that his amount and his co-students' amounts together would have an average of $2,850?

Use the following table to answer questions 5–8.

Monthly Cell Phone Bills

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	x_{10}	x_{11}	x_{12}
$83	$86	$78	$82	$95	$87	$90	$76	$88	$82	$83	$71

5. Write the formula for the mean cell phone bill for the entire year using sigma notation and determine that mean. Round your answer to the nearest cent.

6. Write the formula for the mean cell phone bill for the last six months of the year using sigma notation and determine that mean. Round your answer to the nearest cent.

7. Write the formula for the mean cell phone bill from March to September using sigma notation and determine that mean. Round your answer to the nearest cent.

8. Write the sigma notation mean formula for the 3 consecutive month period that would have the highest mean of the year.

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Use the following table to answer questions 9–11.

Janet attends State University and lives in an on-campus dorm suite with 5 friends. They share the cost of the monthly upgraded cable bill for their suite. Below is a listing of the bills for their freshman year.

Monthly Cable Bill

Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9
$65	$70	$84	$76	$50	$80	$78	$78	$67

9. Round the following value $\frac{1}{9}\sum_{i=1}^{9} x_i$ to the nearest dollar.

Interpret the answer in the context of the problem.

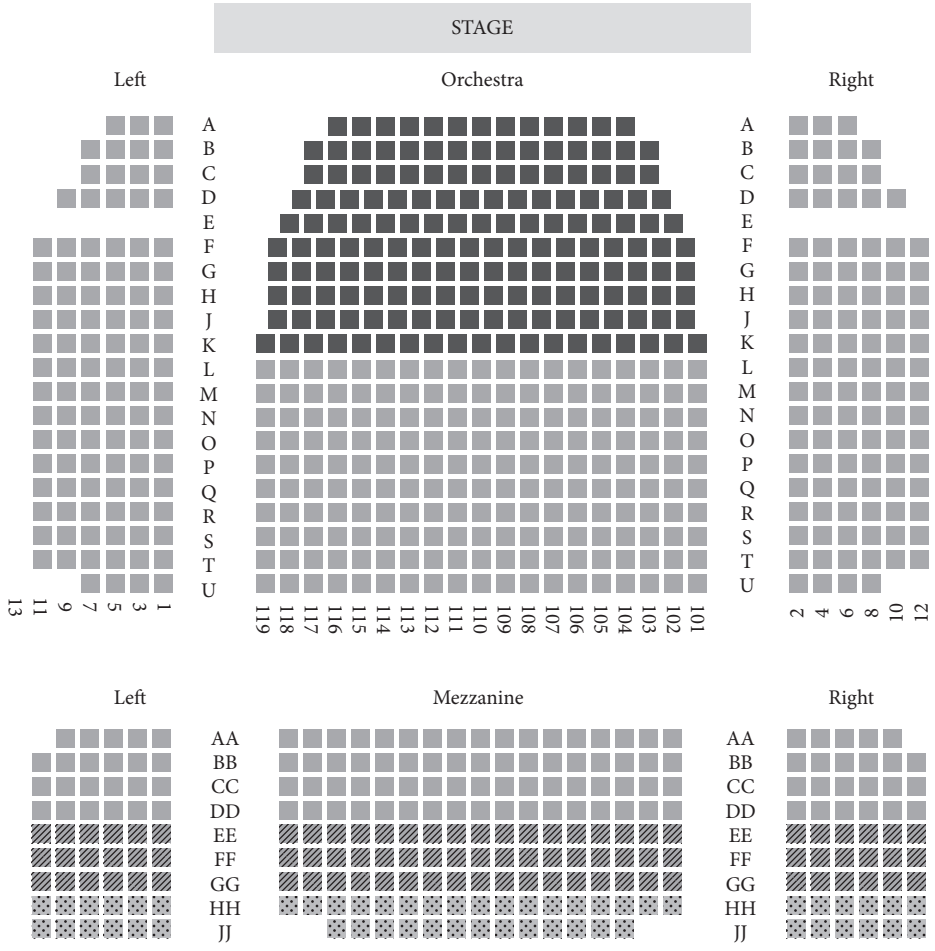
10. Round the following value $\frac{1}{4}\sum_{i=1}^{4} x_i$ to the nearest dollar.

Interpret the answer in the context of the problem.

11. Write the sigma notation mean formula for the second semester beginning in February and determine that semester average rounded to the nearest dollar.

Name _____ Date _____

12. The New York Premier Theater is hosting a concert at which all proceeds will go to the charity. The seating chart is shown here:



The seating options for the color-coded seats are priced as follows:

- Rear Mezzanine 54 seats, each at $150
- Middle Mezzanine 87 seats, each at $200
- Front Mezzanine and Orchestra 512 seats, each at $300
- Front and Center Orchestra 167 seats, each at $500

a. Construct a frequency distribution with column headings "Seat Type", "Price", and "Number of Seats".

b. If all of the seats were sold for this concert, what would be the total amount to be donated to charity?

c. Determine the mean, median, and mode seat prices. Round to the nearest cent.

Name _____ Date _____

13. Although companies would like consumers to believe that identity theft protection is an essential expense, in reality it is discretionary. A consumer organization compared the monthly costs of similar identity theft protection plans on the market and published the following list:

$14.99 $12.75 $14.99 $14.99 $9.99 $25 $25 $10 $14.99 $10 $20 $10 $20

$14.99 $10 $25 $20 $12 $14.99 $25 $25 $20 $12.75 $10 $9.99

a. Write the formula for the mean in sigma notation and use it to calculate the mean monthly plan price. Round your answer to the nearest cent,

b. Construct a frequency distribution for the data.

c. Use the frequency distribution to determine the mean. Round to the nearest cent.

d. Use the frequency distribution to determine the median and the mode.

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1-2 Travel Expenses

Exercises

1. A certain rail company uses a method called demand pricing for setting the prices of their seats. The price per seat starts at a fixed amount. As the train starts to fill up, the prices gradually increase. A consumer watchdog agency selected a random coach car on a train traveling between New York and Philadelphia. They asked each traveler for the price paid for the seat. The following is the result of their survey.

Price	Frequency	Cumulative Frequency
$39	12	
$45	17	
$55	14	
$70	7	
$88	5	
$107	4	

a. Extend the graph by adding a cumulative frequency column. Calculate the 6 entries for that column and answer the questions below.

b. How many passengers paid a fare at or below $45?

c. How many passengers paid a fare at or above $70?

d. How many passengers paid a fare that was at least $45 and at most $88?

2. Use the table in problem 1 to answer these questions.

a. Add a relative frequency column. Calculate the relative frequencies. Round each to the nearest thousandth.

b. Which ticket prices have a relative frequency greater than 0.2 and less than 0.3?

c. Interpret the relative frequency for the $88 ticket price in terms of a percent.

Name _____ Date _____

3. Many people travel to Florida to visit the popular theme parks there. The table below lists yearly attendance at one of those parks for 6 consecutive years.

Year	Attendance in millions
2009	17.3
2010	16.97
2011	17.14
2012	17.54
2013	18.59
2014	19.33

Use the table to answer the questions below.

a. Add a "Relative Frequency" column to the table and determine all of the entries in that column. Round your entries to three decimal places.

b. Add a "Cumulative Frequency" column to the table and determine all of the entries in that column. Express your answer in millions to two decimal places.

c. Add a "Relative Cumulative Frequency" column to the table and determine all of the entries in that column. Round your entries to three decimal places.

d. What was the average monthly number of visitors in millions attending this theme park over this 6-year period? Round to the nearest tenth of a million.

e. What was the median number of park visitors?

f. Use your completed chart. What percent of the total number of visitors attended in 2014?

g. Use your chart. Approximately what percent of all people entering the park did so in 2009, 2010, and 2011 combined? Where would you find this information in your chart?

Name _____ Date _____

4. Jim lives in San Francisco and attends school at a university in New York City. He wants to travel home for his sister's wedding next month and has researched round trip airfares. The table lists all available itineraries with fares below $400.

RT Fares	Frequency	Rel. Freq.	Cum. Freq.	Re. Cum. Freq.
$326	2	0.024	2	0.024
$336	10	0.119	12	0.143
$340	2	0.024	14	0.167
$344	4	b.	18	0.214
$350	5	0.060	23	f.
$357	9	0.107	d.	0.381
$366	15	0.179	47	0.560
$371	3	0.036	50	0.595
$376	2	c.	52	0.619
$379	6	0.071	58	g.
$384	17	0.202	e.	0.893
$392	9	0.107	84	1.000
Total	a.			

Use the table to determine the missing values a–g.

5. Four car rental prices were quoted for a 1-day rental. The frequencies are listed. Let *Y* represent the frequency of the $83 price quote. Use the information shown in the chart to write algebraic expressions for the entries labeled a–e.

1-day Car Rental	Frequency	Relative Frequency	Cumulative Frequency	Relative Cumulative Frequency
$65	4			
$72	2	**b.**		
$83	*Y*	**c.**		
$100	3		**d.**	**e.**
Total	**a.**			

Name _____ Date _____

6. Tesa lives in a major city. Her employer pays for her round trip taxicab fare from home to work each day. She must keep receipts for each trip and turn them in at the end of each month for reimbursement. The fares are based on distance and time so they change each day due to traffic, construction, weather, and other factors. Below is an ordered list of her round-trip fares for the 23 workdays in August.

23.00 23.00 24.25 24.25 24.25 24.25 24.25 24.75

25.50 25.50 25.50 25.50 25.50 25.50 25.60 25.75

25.80 25.80 25.80 25.90 25.90 25.95 25.95

a. Find the percentile rank for a fare of $25.50. Interpret your results.

b. Find the percentile rank for a fare of $25.90. Interpret your results.

c. Based on your answers to parts a and b of this problem, which fare would have a percentile rank of about 70%?

7. The table below lists all train fares quoted from Washington, DC, to Philadelphia, PA, on a given day.

Cost to Airport	Frequency
$42	a
$48	b
$55	c
$68	d
$90	e
$109	f

a. Write an algebraic expression for the percentile rank of $42.

b. Write an algebraic expression for the percentile rank of $48.

c. Write an algebraic expression for the percentile rank of $55.

d. Write an algebraic expression for the percentile rank of $68.

e. Write an algebraic expression for the percentile rank of $90.

f. Write an algebraic expression for the percentile rank of $109.

Name _____ Date _____

1-3 Entertainment Expenses

Exercises

1. Following are the prices of 12 tickets listed on the *Ticket Racket* ticket broker site for a Bruce Springsteen concert.

$75, 120, 120, 145, 150, 150, 150, 175, 175, 200, 225, 275

Round your answers to the nearest hundredth.

a. What is the mean ticket price?

b. What is the median ticket price?

c. What is the mode ticket price?

d. What is the range?

e. What is the variance?

f. What is the standard deviation?

2. The variance of a distribution is 50. What is the standard deviation, rounded to the nearest thousandth?

3. The following is a list of Relay for Life donations given by several community businesses in the Maple Glen High School vicinity.

$10, $50, $100, $100, $100, $120, $120, $125, $150, $150, $250.

Round your answers to the nearest hundredth.

a. What is the mean donation amount?

b. What is the range?

c. What is the variance?

d. What is the standard deviation?

4. Airline fares can vary greatly, even from the same carrier within the same day. The following are fares from New York to Burbank, CA, over the past week.

$430, $567, $334, $701, $424, $555, $890, $455, $450, $1,122

What is the standard deviation for this distribution? Round your answers to the nearest dollar.

5. The distribution of cell phone bills for families in Smithtown North High School has mean $183 and standard deviation 11. At Smithtown South High School, the mean is $181 and the standard deviation is 21. Which distribution is more spread out?

Name _____ Date _____

6. The following is a distribution of the number of individual song downloads made by students in Arlington High School's Acoustic Café Club last year.

12, 11, 21, 43, 23, 51, 19, 22, 88, 60

a. Find the mean number of downloads per club member.

b. If each club member increased their downloads by 6, what happens to the mean?

c. If each club member multiplies their downloads by 3, what happens to the mean?

d. Find the median number of downloads per club member.

e. If each club member increased their downloads by 6, what happens to the median?

f. If each club member multiplies their downloads by 3, what happens to the median?

g. Find the range of the distribution.

h. If each club member increased their downloads by 6, what happens to the range?

i. If each club member multiplies their downloads by 3, what happens to the range?

j. Find the standard deviation of the original distribution to the nearest thousandth.

k. If each club member increased their downloads by 6, what happens to the standard deviation?

l. If each club member multiplies their downloads by 3, what happens to the standard deviation?

7. Look at the original data in problem 6. Suppose the number 60 was changed to 600 and the rest of the numbers remained the same.

a. Would the mean be affected?

b. Would the median be affected?

c. Would the range be affected?

d. Would the standard deviation be affected?

Name _____ Date _____

8. A high school theater production had an admission price of $10. During the show, 876 people paid to enter.

a. What is the range of the distribution of admission fees?

b. What is the standard deviation of the distribution of admission fees?

c. If the standard deviation of a distribution is 0, must all of the data be the same number? Explain.

9. A class of 31 students averaged 82 on a recent exam. Two students were absent and took the exam the next day. The two students averaged 88 on their exam. What was the average for the entire class, including the two students who took the test one day later?

10. The number of cars owned by households in the Lakebridge Condominium Complex is shown in the table.

Number of Cars Owned	Frequency, f	$x_i f$	$x_i - \bar{x}$	$(x_i - \bar{x})^2$	$(x_i - \bar{x})^2 f$
0	22	c.	h.	l.	p.
1	43	d.	i.	m.	q.
2	52	e.	j.	n.	r.
3	3	f.	k.	o.	s.
TOTAL	n = 120	g.			t.

a. Find the mean number of cars owned per household.

b. Fill in the missing entries in the table to the nearest hundredth.

c. Find the standard deviation of the distribution to the nearest hundredth.

12. A distribution consists of 30 scores of 10 and 30 scores of 20. Find the ratio of the range to the standard deviation.

13. Create a distribution of five numbers that has range 10, maximum score 20, and mean 12.

Name _____ Date _____

1-4 Vacation Expenses

Exercises

1. A travel agency did a survey and found that the average local family spends $1,900 on a summer vacation. The distribution is normally distributed with standard deviation $390.

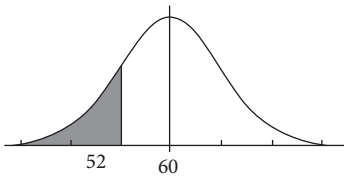
a. What percent of the families took vacations that cost under $1,500? Round to the nearest percent.

b. What percent of the families took vacations that cost over $2,800? Round to the nearest percent.

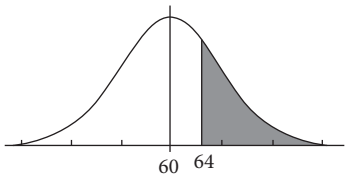
c. Find the amount a family would have spent to be the 60th percentile. Round to the nearest dollar.

2. A distribution is normal with mean 60 and standard deviation 8. Find the area of each of the following shaded regions to four decimal places.

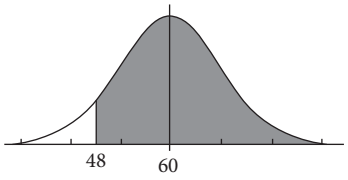
a.



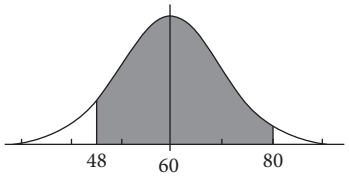
b.



c.



d.



Name _____ Date _____

3. A family of two adults and two children on vacation in the United States will pay an average of $247 per day for food and lodging with a standard deviation of $60 per day, according to a recent survey by a national travel association.

a. Find, to the nearest hundredth, the *z*-score for $150 for vacation food and lodging expenses.

b. If a vacationer had a *z*-score of 2.1, what were their daily expenses for food and lodging?

c. If the data is normally distributed, find the percent of these vacationers who spent less than $307 per day.

d. What is the variance?

e. What is the mean expense for food and lodging for a 7-day vacation?

4. The Vacation Times website rates recreational vehicle campgrounds using integers from 0 to 15. Last year they rated over 1,000 campsites. The ratings were normally distributed with mean 7.6 and standard deviation 1.7.

a. How high would a campsite's rating have to be for it to be considered in the top 10% of rated campsites? Round to the nearest hundredth.

b. Find the *z*-score for a rating of 5. Round to the nearest hundredth.

c. Find the percentile for a rating of 7.5. Round to the nearest percent.

d. A campsite had a *z*-score of 2. What was its rating?

5. A certain amusement park ride requires riders to be at least 48 inches tall. If the heights of children in a summer camp are normally distributed with mean 52 and standard deviation 2.5, how many of the 140 campers will be allowed on the ride? Round to the nearest integer.

6. What *z*-score on the Normal Curve table has an area of 0.8849 to its left?

7. What *z*-score on the Normal Curve table has an area of 0.6808 to its right?

8. *Travel Times Journal* found that the average per person cost of a 10-day trip along the Pacific coast, per person, is $1,015. This includes transportation, food, lodging, and entertainment.

a. If the data is normally distributed with standard deviation $198, find the percent of vacationers who spent less than $1,200 per day. Round to the nearest hundredth of a percent.

b. Find the per-day expense for one of these travelers who had a *z*-score of –1.6.

c. A *Bargain Times Vacation Blog* writer claimed to have done this vacation for a cost of $710 per person. What percentile is represented by $710? Round to the nearest hundredth of a percentile.

9. The school nurse at West Side Elementary School weighs all of the 230 children by the end of September. She finds that the students' weights are normally distributed with mean 98 and standard deviation 16. After compiling all the data, she realizes that the scale was incorrect—it was reading two pounds over the actual weight. She adjusts the records for all 230 children.

a. What is the effect of the correction on the mean?

b. What is the correct mean?

c. What is the effect of the correction on the standard deviation?

10. During a recent summer month, airfares from Miami, FL, to Seattle, WA, were normally distributed with mean $760 and standard deviation $136.

a. Sketch a normal curve and shade in the interval below $500.

b. Find the *z*-score for a fare of $500.

c. What percent of the airfares were below $500?

d. The lowest 5% of airfares represents a real bargain. What airfare represents the 5th percentile?

e. What percent of the airfares were below the median?

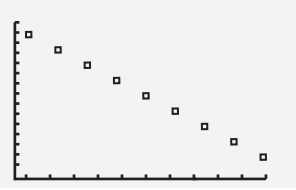
Name _____ Date _____

1-5 Personal Expenses

Exercises

1. Each month you have $200 automatically deposited from your checking account into a discretionary savings account. Your plan is to leave the money in this account for the next 10 years in order to use the total at that time at your discretion. A scatter plot shows the number of months that have passed and the amount in your discretionary spending account each month. The explanatory *x*-variable is the number of months that have passed. The response *y*-variable is the amount in your savings account. Is there a positive or negative correlation? Explain.

2. Determine if the scatter plot below depicts a positive correlation or a negative correlation.



3. Describe each of the following correlation coefficients using the terms strong, moderate, or weak and negative or positive.

a. $r = -0.19$ **b.** $r = -0.93$ **c.** $r = 0.57$

d. $r = 0.0999$ **e.** $r = -0.97$ **f.** $r = -0.45$

4. Lori created a scatter plot where the explanatory variable was the side of a square, and the response variable was the perimeter of the square. Is the data positively or negatively correlated? Explain.

5. In each situation of bivariate data there is causation, so the variables can be named explanatory and response variables. Identify each explanatory variable and response variable.

a. number of days worked, amount earned

b. amount earned in the year, income taxes paid

c. temperature, number of swimmers at the beach

d. price of a dress, number of dresses sold

Name _____ Date _____

6. MoviePlay is an online movie rental service. They have a sliding price list based upon the popularity of the movies. The table below shows the rentals by price category for the month of September. Let *x* represent the price and *y* represent the number of movies rented at that price.

Price	# of rentals
5.99	800
4.99	1,000
3.99	1,200
2.99	1,380
1.99	1,672
0.99	1,903

a. Examine the data without drawing a scatter plot. Describe any trends you see.

b. Draw a scatter plot. Describe the correlation.

c. Based on this information, how many rentals might be anticipated if the company instituted a new price category of $6.99. Explain your reasoning.

Name _____ Date _____

7. The table below lists the percentage of households with an income of $100,000 or more that spent money on fitness-related activities over the course of one year as reported by statista.com.

Fitness Spending in dollars (d)	Percent of households with an income of $100,00 or more
0	53.7%
$0 < d < 250$	17.8%
$250 \leq d < 500$	12.5%
$500 \leq d < 1000$	8.4%
$1000 \leq d < 2000$	5%
$2000 \leq d < 3000$	1.5%
$3000 \leq d < 5000$	0.7%
$5000 \leq d < 10{,}000$	0.2%

a. Without making a scatter plot, what trend do you see in the data.

b. Draw a scatter plot. Let x represent the spending interval number ($x = 1$ when $d = 0$, $x = 2$ when $0 < d < 250$, $x = 3$ when $250 \leq d < 500$ etc.) Describe the correlation.

c. Based on the trend, scatter plot, and correlation, what might you predict the percentage to be for households that had $10,000 to $15,000 fitness-related expenses?

Name _____ Date _____

8. In Application 6 for section 1-5 in the textbook, you were given the following table about discretionary personal back-to-school personal expenses.

Year	Back to School Spending in Dollars per Family
2004	$483.28
2005	$443.77
2006	$527.08
2007	$563.49
2008	$594.24
2009	$548.72
2010	$606.40
2011	$603.63
2012	$688.82
2013	$634.79
2014	$669.28
2015	$630.36

a. Determine the linear regression equation that best fits the data presented in the table. Let x represent the year and y represent the back-to-school spending amount per family. Round numbers to the nearest hundredth.

b. Determine the correlation coefficient for the bivariate data. Round to the nearest hundredth. Interpret that correlation coefficient.

c. Use the linear regression equation to predict the spending amount in 2016. Round your answer to the nearest cent.

d. Rather than using the actual year values, x could have represented the year number where $x = 1$ represents 2004, $x = 2$ represents 2005, and so on. Replace the year numbers for x in your list. Determine the regression line using this bivariate data set. Do you get the same regression equation as in part a?

e. What similarities and differences do you see in the two regression equations? Explain.

f. Use the second linear regression equation to predict the spending for 2016. What x-value will you use in this case to represent 2016?

Name _____ Date _____

9. The Super Bowl is a big money-making and money-spending event. The discretionary spending amounts on Super Bowl weekends are in the billions of dollars. Examine the chart below that lists TV viewer numbers and Super Bowl weekend-related expenses by year.

Year	TV Viewers in millions	Money Spent in billions
2007	93.18	8.71
2008	92.45	9.47
2009	98.73	9.56
2010	106.48	8.87
2011	111	10.15
2012	111.3	11.02
2013	108.4	12.28
2014	111.5	12.37
2015	114.4	14.31
2016	111.9	15.53

a. Determine the linear regression equation where x represents the year number ($x = 1$ represents 2007, $x = 2$ represents 2008, etc.) and y represents the money spent. Round all numbers to the nearest thousandth. What is the correlation coefficient? What can you infer from the coefficient?

b. Determine the linear regression equation where x represents the number of TV viewers and y represents the money spent. Round all numbers to the nearest thousandth. What is the correlation coefficient? What can you infer from the differences between this coefficient and the one found in part a?

Name _____ Date _____

2-1 Checking Accounts

Exercises

1. Mitchell has a balance of $1,200 in his First State Bank checking account. He deposits a $387.89 paycheck, a $437.12 dividend check, and a personal check for $250 into his account. He wants to receive $400 in cash. How much will he have in his account after the transaction?

2. Meg has a total of *d* dollars in her checking account. She makes a cash deposit of *c* dollars and a deposit of three checks each worth *s* dollars. She would like *e* dollars in cash from this transaction. She has enough money in her account to cover the cash received. Express her new checking account balance after the transaction as an algebraic expression.

3. Neal deposited a $489.50 paycheck, an *x* dollar stock dividend check, a *y* dollar rebate check, and $85 cash into his checking account. His original account balance was *w* dollars. Assume each check clears. Write an expression for the balance in his account after the deposits?

4. Elaine has *m* dollars in her checking account. On December 8, she deposited $1,200, *r* dollars, and $568.90. She also cashed a check for *t* dollars and one for $73.70. Write an algebraic expression that represents the amount of money in her account after the transactions.

5. Del and Jen have a joint checking account. Their balance at the beginning of October was $6,238.67. During the month they made deposits totaling *d* dollars, wrote checks totaling $1,459.98, paid a maintenance fee of *z* dollars, and earned *b* dollars in interest on the account. Write an algebraic expression that represents the balance at the end of the month?

6. New Merrick Bank charges a $21-per-check overdraft protection fee. On June 5, Lewis had $989.00 in his account. Over the next few days, the following checks were submitted for payment at his bank: June 6, $875.15, $340.50, and $450.63; June 7, $330; and June 8, $560.00.

a. How much will he pay in overdraft protection fees?

b. How much will he owe the bank after June 8?

7. Dean has a checking account at City Center Bank. During the month of April, he made deposits totaling $2,458.52 and wrote checks totaling $789.23. He paid a maintenance fee of $25 and earned $3.24 in interest. His balance at the end of the month was $4,492.76. What was the balance at the beginning of April?

8. Bellrose Bank charges a monthly maintenance fee of $17 and a check-writing fee of $0.05 per check. Last year, Patricia wrote 445 checks from her account at Bellrose. What was the total of all fees she paid on that account last year?

Name _____ Date _____

9. Create a check register for the transactions listed.

a. Your balance on 1/5 is $822.67.

b. You write check 1076 on 1/6 for $600.00 to Excel Health Club.

c. You deposit a paycheck for $227.45 on 1/11.

d. You deposit a $50 rebate check on 1/15.

e. On 1/16, you begin writing a donation check to Clothes for Kids but make an error and have to void the check. You write the very next check for $100 to this organization.

f. On 1/20, you withdraw $200 from the ATM at the mall. The company owning the ATM charges you $3.50 and your bank charges you $2.50 for the ATM transaction.

g. On 1/21, you made a debit card purchase at Stacy's Store for $134.87.

h. Your friend gave you the $1,300 he owed you and you deposit it on 1/22.

i. You write the next check on 1/23 to iBiz for $744.24 for a new computer.

j. You deposit your paycheck for $227.45 on 1/23.

k. On 1/24, you withdraw $50 from the ATM affiliated with your bank. There are no fees.

l. On 1/24, you write the next check for $75.00 to iTel Wireless.

m. On 1/25, you write a check for $120 concert tickets to Ticket King.

NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT		✓	FEE	DEPOSIT AMOUNT		$ BALANCE
			$						

Name _____ Date _____

10. Create a check register for the transactions listed.

a. Your balance on 2/25 is $769.22.

b. On 2/25, you write check 747 for $18 to Steve Smith.

c. On 2/27, you deposit your paycheck in the amount of $450.80.

d. Your grandparents send you a check for $50, which you deposit into your account on 2/28.

e. On 3/2 you write a check to North State College for $300.00 and another check to Middle Island Auto Parts for $120.65.

f. Later in the day on 3/2 you write two more checks: Metro Transit for $85.00 and Bling's Department Store for $58.76.

g. On 3/3, at Border Barns Books, as you write the next check for $105.85, you make a mistake and void that check. You pay with the next available check in your checkbook.

h. On 3/5, you deposit a rebate check for $425 into your checking account.

i. On 3/8, you pay your car insurance with an e-check to AllFarm Insurance for $521.30.

j. On 3/10, you withdraw $300 from the ATM. There is a $4.50 charge for using the ATM.

k. On 3/11, you deposit your paycheck in the amount of $450.00.

l. On 3/12, you use your debit card to make three purchases at Sports Master: $88.91, $23.50, and $100.70.

m. On 3/13, you transfer $1,000 from your savings account into your checking account.

n. On 3/13, you write a check to Empire Properties for your first month's rent in your new apartment in the amount of $820.00.

o. On 3/15, you use your debit card to purchase a $150.00 microwave at Kitchen Supply.

Name _____ **Date** _____

(Transactions are listed on the previous page.)

NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT		✓	FEE	DEPOSIT AMOUNT		$ BALANCE
			$						

Name _____ Date _____

2-2 Reconcile a Bank Statement

Exercises

1. On the back of Elise's monthly statement, she listed the following outstanding withdrawals: #123, $76.09; #117, $400; #130, $560.25; debit card, $340.50; and #138, $83.71. She also determined that a deposit for $500 and another for $328.90 are outstanding. Using these outstanding transactions, what adjustment will have to be made to her statement balance?

2. Pina filled out the following information on the back of her monthly statement:

Ending balance from statement	$1,139.78
Deposits outstanding	+ $280.67
Total of checks outstanding	– $656.91
Revised statement balance	$_____
Balance from checkbook	$763.54

Find Pina's revised statement balance. Does her account reconcile?

3. Tasha filled out the following information on the back of her bank statement:

Ending balance from statement	$764.22
Deposits outstanding	+ $387.11
Total of checks outstanding	– $455.32
Revised statement balance	$_____
Balance from checkbook	$669.01

Find Tasha's revised statement balance. Does her account reconcile?

4. Lenny opened a checking account last month. Today he received his first statement. The statement listed five deposits and 24 checks that cleared. Lenny's check register shows nine outstanding checks. How many checks has Lenny written since the account was opened?

5. Arden's checking account charges a $21 monthly maintenance fee with no per-check fee. He wants to switch to a different account with a fee of 18 cents per check and a $15 monthly maintenance fee. The following information is about his last five monthly statements.

Month	Number of Checks on Statement	Month	Number of Checks on Statement	Month	Number of Checks on Statement
Feb	24	Mar	37	Apr	35
May	33	June	41		

a. What is the mean number of checks Arden wrote per month during the last five months?

b. About how much should Arden expect to pay per month for the new checking account?

c. What advice would you give Arden?

Name _____ Date _____

6. Below you will find Mitch West's monthly statement and his check register. Use them to complete parts a–e in his checking account summary. Does his account reconcile?

Mitch West
23 Sycamore Lane
Benridge, NY 10506

ACCOUNT NUMBER: 456213-A232
STATEMENT PERIOD: 5/15 - 6/15

STARTING BALANCE → **$ 2,312.70**

DATE	DESCRIPTION	CHECK NUMBER	TRANSACTION AMOUNT	BALANCE
8/16	W/D	1056	$ 256.00	
8/20	DEPOSIT		$ 1,200.80	
8/22	W/D	Debit card	$ 234.81	
8/22	W/D	1058	$ 334.90	
8/23	W/D	Debit Card	$ 34.72	
8/25	W/D	1060	$ 145.78	
8/26	W/D	1059	$ 56.00	
8/27	DEPOSIT		$ 150.00	
9/1	W/D	1061	$ 230.00	

ENDING BALANCE → $2,368.29

NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT	✓	FEE	DEPOSIT AMOUNT	$ BALANCE
							2,309.70
1056	8/15	Best Offer Inc.	$ 256 00				- 256.00 / 2,053.70
1057	8/16	Dept. of Motor Vehicles	86 50				- 86.50 / 1,967.20
1058	8/16	AutoWorld	334 90				- 334.90 / 1,632.30
	8/18	Car Nation	234 81				- 234.81 / 1,397.49
	8/20	Deposit				1,200 80	+ 1,200.80 / 2,598.29
1059	8/21	Print Makers	56 00				- 56.00 / 2,542.29
1060	8/22	Book Bonanza	145 78				- 145.78 / 2,396.51
	8/23	Fast Freddy's Fast Food	34 72				- 34.72 / 2,361.79
	8/27	Deposit				150 00	+ 150.00 / 2,511.79
1061	8/30	Lincoln Savings Bank	230 00				- 230.00 / 2,281.79
1062	9/1	VOID					
1063	9/1	Pasta Pete's	32 50				- 32.50 / 2,249.29
	9/2	Deposit				300 00	+ 300.00 / 2,549.29

Checking Account Summary

Ending Balance from Statement	**a.**
Deposits Outstanding	**+ b.**
Total of Checks Outstanding	**– c.**
Revised statement balance	**d.**
Balance from Checkbook	**e.**

Name _____ Date _____

2-3 Savings Accounts

Exercises

1. Gary deposits $3,700 in an account that pays 2.15% simple interest. He keeps the money in the account for three years, but doesn't make any deposits or withdrawals. How much interest will he receive after the three years?

2. How much simple interest is earned on $6,000 at an interest rate of 2.25% in $4\frac{1}{2}$ years?

3. How much principal would you have to deposit to earn $700 simple interest in $1\frac{1}{2}$ years at a rate of 2%.?

4. Jesse estimates that it will cost $300,000 to send his newborn son to a private college in 18 years. He currently has $65,000 to deposit in an account. What simple interest rate would he need so that $65,000 grows into $300,000 in 18 years? Round to the nearest percent.

5. Dillon has a bank account that pays 3.2% simple interest. His balance is $1,766. How long will it take for the amount in the account to grow to $2,000? Round to the nearest year.

6. How long will it take $5,000 to double in an account that pays 1.6% simple interest? Round to the nearest year.

7. How much simple interest would $1,500 earn in 11 months at an interest rate of 3.75%?

8. How much simple interest would $1,000 earn in 275 days at an interest rate of 4.21%? (There are 365 days in a year.)

9. Colin deposited $1,230 in an account that pays 2.19% simple interest for three years.

a. What will the interest be for the three years?

b. What will be the new balance after three years?

c. How much interest did the account earn the first year, to the nearest cent?

d. How much interest did the account earn the second year, to the nearest cent?

e. How much interest did the account earn the third year, to the nearest cent?

Name _____ Date _____

10. Gerry deposited $1,230 in an account that pays 2.19% simple interest for one year.

a. How much interest will he earn in one year?

b. What will his balance be after one year?

c. Gerry withdraws all of the principal and interest after the first year and deposits it into another one-year account at the same rate. What will his interest be for the second year?

d. What will his balance be after two years?

e. Compare the accounts of Gerry and Colin from Exercise 9. Who earned more interest the second year, Gerry or Colin? Explain.

11. Use the simple interest formula to find the missing entries in the following table. Round monetary amounts to the nearest cent, percents to the nearest hundredth of a percent, and time to the nearest month. Use 365 days = 1 year.

Interest	Principal	Rate	Time
a.	$980	2.6%	1 yr
b.	$2,900	3.05%	15 mo
$400	$3,500	4.5%	**c.**
$400	**d.**	0.66%	4 years
$400	$3,000	**e.**	3 yr
f.	$750,000	1.2%	100 days
y dollars	p	2.11%	**g.**

12. How much simple interest would x dollars earn in 13 months at a rate of r percent?

13. How long would $100,000 take to double at a simple interest rate of 8%?

14. How long would $450 take to double at a simple interest rate of 100%?

15. What simple interest rate, to the nearest tenth, is needed for $15,000 to double in 8 years?

16. Arrange these fractions of a year in ascending order: 190 days, 5 months, 160 days, 7 months, 200 days.

17. Max has $17 in a fund he is creating to save for a bike. He adds $6 per week of his babysitting earnings to the fund. If his weekly fund balance is represented by an arithmetic sequence, find the 27th term.

Name _____ Date _____

2-4 Explore Compound Interest

Exercises

Round to the nearest cent where necessary.

1. How much interest would $2,000 earn in one year at the rate of 1.2%?

2. How much interest would $2,000 earn, compounded annually, in two years at the rate of 1.2%?

3. How much interest would $2,000 earn, with simple interest, in two years at the rate of 1.2%?

4. Compare your answers to Exercises 2 and 3. Explain why they differ.

5. How much would *d* dollars earn in one year at the rate of *p* percent compounded annually?

6. Margaret deposits $1,000 in a savings account that pays 1.4% interest compounded semiannually. What is her balance after one year?

7. How much interest does $5,300 earn at a rate of 2.8% interest compounded quarterly, in three months?

8. Mr. Guny deposits $4,900 in a savings account that pays 1.5% interest compounded quarterly.

a. Find the first quarter's interest.

b. Find the first quarter's balance.

c. Find the second quarter's interest.

d. Find the second quarter's balance.

e. Find the third quarter's interest.

f. Find the third quarter's balance.

g. Find the fourth quarter's interest.

h. Find the fourth quarter's balance.

i. How much interest does the account earn in the first year?

9. Jonathan deposits $6,000 in a savings account that pays 2.1% interest compounded quarterly. What is his balance after one year?

10. How much interest would $1,000,000 earn at 2% compounded daily, in one day?

11. How much interest would y dollars earn in one day at a rate of 1.75% compounded daily?

12. Mrs. Huber opened a savings account on June 26 with a $1,300 deposit. The account pays 1.6% interest compounded daily. On June 27, she deposited $450 and on June 28 she withdrew $110. Complete the table based on Mrs. Huber's banking activity.

	June 26	June 27	June 28
Opening balance	**a.**	**f.**	**k.**
Deposit	**b.**	**g.**	—
Withdrawal	—	—	**l.**
Principal used to Compute Interest	**c.**	**h.**	**m.**
Interest	**d.**	**i.**	**n.**
Ending Balance	**e.**	**j.**	**o.**

13. Mr. Nolan has a bank account that compounds interest daily at a rate of 1.7%. On the morning of December 7, the principal is $2,644.08. That day he withdraws $550 to pay for a snow blower. Later that day he receives a $934 paycheck from his employer, and he deposits that in the bank. On December 8, he withdraws $300 to go holiday shopping. What is his balance at the end of the day on December 8?

14. Mrs. Platt has an account that pays *p* percent interest compounded daily. On April 27, she had an opening balance of *b* dollars. Also on April 27, she made a *w* dollars withdrawal and a *d* dollars deposit. Express her interest for April 27 algebraically.

15. This morning, Mrs. Rullan had a balance of 1,000 dollars in an account that pays 2.05% interest compounded weekly. Express her interest for the following week if she makes no deposits or withdrawals.

16. Kristin deposited $9,000 in an account that has an annual interest rate of 2.1% compounded monthly. How much interest will she earn at the end of one month?

17. How much would $25,000 earn in one hour at the rate of 5%, compounded hourly?

18. The Jules Server Scholarship Fund gives a graduation award of $250 to a graduating senior at North End High School. Currently the fund has a balance of $8,300 in an account that pays 2.2% interest compounded annually. Will the amount earned in annual interest be enough to pay for the award?

19. Kelly has *d* dollars in an account that pays 1.4% interest compounded weekly. Express her balance after one week algebraically.

Name _____ Date _____

2-5 Compound Interest Formula

Exercises

Round to the nearest cent wherever necessary.

1. Mr. Mady opens a savings account with principal *P* dollars that pays 2.11% interest compounded quarterly. Express his ending balance after one year algebraically.

2. Jeff deposits $2,300 at 1.13% interest compounded weekly. What will be his ending balance after one year?

3. Nancy has $4,111 in an account that pays 1.07% interest compounded monthly. What is her ending balance after two years?

4. Mr. Weinstein has a savings account with a balance of $19,211.34. It pays 1.1% interest compounded daily. What is his ending balance after three years, if no other deposits or withdrawals are made? How much interest does he earn over the three years?

5. If you invested $10,000 at 3.8% compounded hourly for five years, what would be your ending balance?

6. Danielle has a CD at Crossland Bank. She invests $22,350 for four years at 1.55% interest, compounded monthly. What is her ending balance? How much interest did she make?

7. Ms. Santoro is opening a one-year CD for $16,000. The interest is compounded daily. She is told by the bank representative that the annual percentage rate (APR) is 1.8%. What is the annual percentage yield (APY) for this account?

8. Knob Hill Savings Bank offers a one-year CD at 1.88% interest compounded daily. What is the APY for this account? Round to the nearest hundredth of a percent.

9. Kings Park Bank is advertising a special 1.66% APR for CDs. Kevin takes out a one-year CD for $24,000. The interest is compounded daily. Find the APY for Kevin's account.

10. Imagine that you invest $100,000 in an account that pays 5.9% annual interest compounded monthly. What will your balance be at the end of 18 years?

11. Yurik invests $88,000 in a CD that is locked into a 1.75% interest rate compounded monthly, for seven years. How much will Yurik have in the account when the CD matures?

Name _____ Date _____

12. Stephanie has created a study tool to help her study compound interest. She writes the compound interest formula with letters different than the traditional representations.

$$X = M\left(1+\frac{Q}{K}\right)^{KB}$$

a. If Q is increased, does the new balance increase or decrease? Explain your answer.

b. If K is decreased, does the new balance increase or decrease? Explain.

c. If B is increased, does the new balance increase or decrease? Explain.

d. Is it possible that $M > X$? Explain.

e. Using Stephanie's variable representation, express the amount of interest earned on the account.

13. Compare the simple interest for one year on a principal of 1 million dollars at an interest rate of 6.3% to compounding every second for the same principal and interest rate.

a. How many seconds are in an hour?

b. How many seconds are in a day?

c. How many seconds are in a year?

d. How much interest does $1,000,000 earn in one year at 6.3% interest, compounded every second?

e. How much does the same $1,000,000 earn at 6.3% in one year, under simple interest?

f. How much more interest did the compounded every second account earn when compared to the simple-interest account?

14. Britney invested $4,000 in a CD at TTYL Bank that pays 1.4% interest compounded monthly.

a. How much will Britney have in her account at the end of one year?

b. What is the APY for this account? Round to the nearest hundredth of a percent.

15. How much more would $5,000 earn in 10 years, compounded daily at 2%, when compared to the interest on $5,000 over 10 years, at 2% compounded semiannually?

Name _____ Date _____

2-6 Continuous Compounding

Exercises

Round to the nearest cent wherever necessary.

1. Given the function $f(x) = \frac{1{,}234{,}999}{x}$, as the values of x increase toward infinity, what happens to the values of $f(x)$?

2. As the values of x increase toward infinity, what happens to the values of $g(x) = 3x - 19$?

3. Given the function, $h(x) = \frac{8x-3}{4x+5}$, as the values of x increase towards infinity, use a table to find out what happens to the values of $h(x)$.

4. If $f(x) = \frac{10}{x^2}$ use a table and your calculator to find $\lim_{x \to \infty} f(x)$.

5. Given the function $f(x) = 2^x$, find $\lim_{x \to \infty} f(x)$.

6. Given the function $f(x) = \left(\frac{1}{2}\right)^x$, use a table to compute $\lim_{x \to \infty} f(x)$.

7. If you deposit $1,000 at 100% simple interest, what will your ending balance be after one year?

In 8–12, you compare simple interest with daily compounding and continuous compounding.

8. If you deposit $10,000 at 1.85% simple interest, what would your ending balance be after three years?

9. If you deposit $10,000 at 1.85% interest, compounded daily, what would your ending balance be after three years?

10. If you deposit $10,000 at 1.85% interest, compounded continuously, what would your ending balance be after three years?

11. How much more did the account that was compounded continuously earn compared to the account compounded daily?

12. How much more did the account that was compounded daily earn compared to the simple-interest account?

Name _____ Date _____

13. Eric deposits $4,700 at 1.03% interest, compounded continuously for five years.

a. What is his ending balance?

b. How much interest did the account earn?

14. Write the verbal sentence that is the translation of $\lim_{x \to \infty} f(x) = 3.66$.

15. Write the verbal sentence given below symbolically using limit notation.

The limit of g(x), as x approaches zero, is fifteen.

16. Given the function $f(x) = \frac{2x - 17}{x}$, use a table to find $\lim_{x \to \infty} f(x)$.

17. Find the balance for each compounding period on $50,000 for $2\frac{1}{2}$ years at a rate of 1.3%.

a. Annually

b. Semiannually

c. Quarterly

d. Monthly

e. Daily

f. Hourly

g. Continuously

18. A private university has an endowment fund that currently has 49 million dollars in it. If it is invested in a one-year CD that pays 2% interest compounded continuously, how much interest will it earn?

19. Use a table of increasing values of *x* to find each of the following limits.

a. $\lim_{x \to \infty} f(x)$ if $f(x) = \frac{5x - 2}{x + 3}$

b. $\lim_{x \to \infty} g(x)$ if $g(x) = \frac{12x + 5}{4x + 3}$

c. $\lim_{x \to \infty} f(x)$ if $f(x) = \frac{5x^3 - 100}{x^2}$

d. $\lim_{x \to \infty} f(x)$ if $f(x) = \frac{7x^2 - 1}{x^3 + 2}$

20. Find the interest earned on a $14,000 balance for nine months at 1.1% interest compounded continuously.

21. Assume you had *P* dollars to invest in an account that paid 5% interest compounded continuously. How long would it take your money to double? (Hint: Try substituting different numbers of years into the continuous compounding formula). Round to the nearest year.

Name _____ Date _____

2-7 Future Value of Investments

Exercises

1. Vincent made a $2,000 deposit into an account on August 1 that yields 2% interest compounded annually. How much money will be in that account at the end of 5 years?

2. On December 31, Juan Carlos made a $7,000 deposit in an account that pays 0.9% interest compounded semi annually. How much will be in that account at the end of two years?

3. Liam was born on October 1, 2009. His grandparents put $20,000 into an account that yielded 3% interest compounded quarterly. When Liam turns 18, his grandparents will give him the money for a college education. How much will Liam get on his 18th birthday?

4. Colleen is 15 years from retiring. She opens an account at the Savings Bank. She plans to deposit $10,000 each year into the account, which pays 1.7% interest, compounded annually.

a. How much will be in the account in 15 years?

b. How much interest would be earned?

5. Anton opened an account at Bradley Bank by depositing $1,250. The account pays 2.325% interest compounded monthly. He deposits $1,250 every month for the next two years.

a. How much will he have in the account at the end of the two-year period?

b. Write the future value function. Let x represent each of the monthly interest periods.

c. Graph the future value function.

d. Using your graph, what will the approximate balance be after one year?

6. Sylvia wants to go on a cruise around the world in 5 years. If she puts $50 into an account each week that pays 2.25% interest compounded weekly, how much will she have at the end of the five-year period?

Name _____ Date _____

7. Fatima opened a savings account with $7,500. She decided to deposit that same amount semiannually. This account earns 1.975% interest compounded semiannually.

a. What is the future value of the account after 10 years?

b. Write the future value function. Let *x* represent the number of semiannual interest periods.

c. Graph the future value function.

d. Using your graph, what is the approximate amount in her account after 18 months?

8. Marina invests $200 every quarter into an account that pays 1.5% annual interest rate compounded quarterly. Adriana invests $180 in an account that pays 3% annual interest rate compounded quarterly.

a. Determine the amount in Marina's account after 10 years.

b. Determine the amount in Adriana's account after 10 years.

c. Who had more money in the account after 10 years?

d. Write the future value function for Marina's account.

e. Write the future value function for Adriana's account.

f. Graph Marina and Adriana's future value function on the same axes.

g. Interpret the graph in the context of the two future value functions.

Name _____ Date _____

2-8 Present Value of Investments

Exercises

1. Complete the table to find the single deposit investment amounts.

Future Value	Rate	Time	Deposit (to nearest cent)
$200	2% compounded annually	2 yr	**a.**
$400	1.5% compounded semiannually	4 yr	**b.**
$5,000	1.1% compounded quarterly	8 yr	**c.**
$25,000	2.1% compounded monthly	64 mo	**d.**

2. Complete the table to find the periodic deposit investment amounts.

Future Value	Rate	Time	Deposit (to nearest cent)
$7,000	1.25% compounded annually	5 yr	**a.**
$9,500	2.6% compounded semiannually	8 yr	**b.**
$500,000	1.625% compounded quarterly	15 yr	**c.**
$1,000,000	2% compounded monthly	246 mo	**d.**

3. When his daughter Alisa was born, Mike began saving for her wedding. He wanted to have saved about $30,000 by the end of 20 years. How much should Mike deposit into an account that yields 3% interest compounded annually in order to have that amount? Round your answer to the nearest thousand dollars.

4. How long will it take for $5,000 to grow to $10,000 in an account that yields 1.2% interest compounded annually. Experiment with the formula in your calculator using different years or use logarithms.

5. Martina will be attending 4 years of undergraduate school and four more years of graduate school. She wants to have $200,000 in her savings account when she graduates in 8 years. How much must she deposit in an account now at a 2.6% interest rate that compounds monthly to meet her goal? Round your answer to the nearest dollar.

Name _____ Date _____

6. Kate wants to install an in ground pool in five years. She estimates the cost will be $50,000. How much should she deposit monthly into an account that pays 1.6% interest compounded monthly in order to have enough money to pay for the pool in 5 years? Round your answer to the nearest dollar.

7. Amber wants to have saved $300,000 by some point in the future. She set up a direct deposit account with a 1.75% APR compounded monthly, but she is unsure of how much to periodically deposit for varying lengths of time. Set up a present value function and graph that function to depict the present values for this situation from 12 months to 240 months.

8. Geri wants $30,000 at the end of five years in order to pay for new siding on her house. If her bank pays 2.2% interest compounded annually, how much does she have to deposit each year in order to have that amount?

9. Uncle Al wants to open an account for his nieces and nephews that he hopes will have $100,000 in it after 25 years. How much should he deposit now into an account that yields 1.75% interest compounded monthly so he can be assured of meeting that goal amount?

10. Althea will need $30,000 for her nursing school tuition in 18 months. She has a bank account that pays 2.45% interest compounded monthly. How much does she have to put in each month to have enough money for the tuition?

11. Art opened an account online that pays 1.8% interest compounded monthly. He has a goal of saving $20,000 by the end of four years. How much will he need to deposit each month?

12. Anthony wants to repay the loan his parents gave him in three years. How much does he need to deposit into an account semiannually that pays 1.25% interest twice a year in order to have $35,000 to repay the loan?

13. Lorna needs $40,000 for a down payment when she buys her boat in 4 years. How much does she need to deposit into an account that pays 1.15% interest compounded quarterly in order to meet her goal?

Graph the present value function for this situation.

14. How much should Sandy deposit each month into a 2.85% account, which compounds interest monthly, if she wants to save $85,000? Use a span from year 0 to year 10 in months.

Name _____ Date _____

2-9 The Term of a Single Deposit Account

Exercises

1. In each of the following compound interest equations with t representing the account term, determine the number of times the account is compounded per year and the interest rate percent.

a. $314{,}961.92 = 280{,}000(1.04)^{t}$

b. $4{,}050 = 1{,}800(1.0125)^{4t}$

c. $2{,}142 = 350(1.006)^{2t}$

d. $10{,}008 = 1{,}200(1.0036)^{12t}$

e. $578.88 = 500(1.007)^{3t}$

2. Rewrite each of the compound interest equations in #2 as an exponential equation in the standard form $a = b^{c}$.

3. Solve for t in each of the following compound interest equations. Leave your answer in terms of a logarithm.

a. $12{,}800 = 640(1.008)^{2t}$

b. $32{,}500 = 5{,}000(1.04)^{t}$

c. $9{,}800 = 1{,}000(1.0025)^{12t}$

d. $18{,}500 = 500(1.00375)^{4t}$

e. $39{,}000 = 30{,}000(1.006)^{3t}$

4. In each of the equations below, t represents the term of a savings account. Find the value of t to the nearest tenth of a year.

a. $t = \dfrac{\log_{1.02}(2.875)}{12}$

b. $t = \dfrac{\log_{1.12}(3.4)}{3}$

c. $t = \dfrac{\log_{1.011}(100.15)}{2}$

d. $t = \dfrac{\log_{1.025}(20.7)}{6}$

e. $t = \dfrac{\log_{1.009}(8.125)}{12}$

Name _____ Date _____

5. In each of the following compound interest equations, the variable n represents the number of times per year that the interest is compounded. Use logarithms to write an expression for n. Evaluate the expression to the nearest integer.

a. $6{,}720 = 6{,}400(1.00125)^{6n}$

b. $12{,}150 = 9{,}000(1.005)^{10n}$

c. $762.5 = 625(1.008)^{4n}$

d. $232{,}200 = 180(1.051)^{12n}$

e. $1{,}860 = 150(1.0625)^{3n}$

6. Shannon wants to start saving for her retirement. Her goal is to save $350,000. If she deposits $250,000 into an account that pays 2.04% interest compounded monthly, approximately how long will it take for her money to grow to the desired amount? Round your answer to the nearest tenth of a year.

7. Steve has $125,000 to invest in a savings account that pays 3.25% interest compounded quarterly. How many years will it take for the account to earn $15,000 in interest? Round your answer to the nearest tenth of a year.

8. Daisy deposited $600 into an account that compounds interest daily at a rate of 1.46%. At the end of a certain period of time, he had a balance in the account of $645.

a. Write an expression for the account term t but do not evaluate it.

b. Using the expression you determined in part **a** and the change-of-base formula with common logarithms, determine a value of the account term t.

c. Using the expression you determined in part **a** and the change-of-base formula with natural logarithms, determine a value of the account term t. Round the term to the nearest year.

d. What do you notice about the values of t found in parts **c** and **d**? Explain your reasoning for the results.

9. Jasper deposits $20,000 into an account that compounds interest continuously at a rate of 3.4%. To the nearest tenth of a year, how long will it take his money to grow to $30,500?

Name _____ Date _____

10. The time it takes for money to quadruple in an account where r is the interest rate expressed as a decimal compounded annually is given by the formula $t = \frac{\log 4}{\log(1+r)}$. Use the compound interest formula to derive this result.

11. Andy deposited $15,000 in an account that yields 2.8% interest compounded quarterly. How long will it take for his balance to increase by 25%?

Name _____ Date _____

2-10 The Term of a Systematic Account

Exercises

1. Use the Power Property of logarithms to determine the value. In some cases, there will be a numerical answer. In others the answer will be an algebraic expression.

a. $\log(10^5)$

b. $\log(a^2)$

c. $\log_y 3^x$

d. $\ln e^m$

e. $\ln(a+b)^c$

2. Use the change of base property to write the given logarithm as a quotient of common logs. Do not evaluate.

a. $\log_6 144$

b. $\log_a(b-c)$

c. $\log_7 t$

d. $\log_{ab} 5$

e. $\ln k$

3. Use the One-To-One Property and the Power Property to find the value of t to the nearest tenth in each of the following.

a. $15.625 = (2.5)^t$

b. $8^t = 26{,}2144$

c. $5^{2t} = 9{,}765{,}625$

d. $(3.5)^{2t+1} = 525.21875$

e. $3^{\frac{t}{2}} + 10 = 6{,}571$

4. Use the compound interest formula $B = P(1+\frac{r}{n})^{nt}$ in each of the following to express t in terms of a logarithm by rewriting the exponential equation in logarithmic form. Simplify where possible but do not evaluate.

a. $B = 800$, $P = 500$, $r = .02$, $n = 2$

b. $B = 13{,}520$, $P = 5{,}200$, $r = .03$, $n = 6$

c. $B = 750{,}000$, $P = 500{,}000$, $r = .036$, $n = 4$

Name _____ Date _____

Use the following situation for questions 5 and 6. Barbara has deposited money into a savings account at Center City Bank. The account pays 3% interest compounded monthly. How long will it take for $5,000 to grow to $5,600.

5. Use the steps below to find the value of *t* to the nearest year.

a. Substitute the values in the compound interest formula.

b. Simplify the value inside the parentheses.

c. Divide both sides by the value of *P*. You should now have an exponential equation in standard form.

d. Rewrite the exponential equation in an equivalent logarithmic form.

e. Apply the change of base formula to change the logarithm into a quotient of two common logs.

f. Find the value of the quotient to the nearest thousandth.

g. Divide both sides by the coefficient of *t*. Round to the nearest tenth of a year.

6. Use the steps below to find the value of *t* to the nearest year.

a. Substitute the values in the compound interest formula.

b. Simplify the value inside the parentheses.

c. Divide both sides by the value of P. You should now have an exponential equation in standard form.

d. Apply the One-To-One Property using common logs.

e. Simplify the side of the equation with the exponent by applying the Power Property.

f. Solve for *t*. This will be a three-step process. Divide both sides by the logarithmic coefficient; divide both sides by the value of *n*; simplify and round to the nearest tenth of a year.

Name _____ Date _____

Questions 5 and 6 offered the steps for finding the term of a savings account using two different methods. Select either method to solve questions 7 and 8.

7. iPartner is an online bank that offers a locked-in interest rate of 3.6% compounded monthly. Rich makes an initial deposit of $10,000. How long does he have to keep the money in this account in order to have a balance of $12,000? Round to the nearest year.

8. Danka opened a savings account that pays 1.8% interest compounded continuously. Her initial deposit was $160. How long would she have to leave the money in the account for it to reach $250?

9. Bill want to make monthly deposits of $75 into a savings account that offers 2.7% interest compounded monthly. Use the future balance of a periodic investment formula to determine how long will it take for the account balance to reach $2000. Round to the nearest tenth of a year.

10. If Graziela makes quarterly deposits of $800 into an account that pays 1.8% interest quarterly, how long will it take for her principal to grow to $20,000? Use the future balance of a periodic investment formula to answer the question. Round to the nearest tenth of a year.

Name _____ Date _____

11. An alternative method for solution to problems similar to Exercises 9 and 10 would have been to use the present value formula from section 2-8 as shown here:

$$P = \frac{B \times \frac{r}{n}}{\left(1 + \frac{r}{n}\right)^{nt} - 1}$$

In a–h below, write the equations that result when you follow the steps to use this formula to solve exercise 10.

a. Let $B = 20{,}000$, $P = 800$, $r = 0.018$, and $n = 4$. Substitute these values into the present value formula.

b. Simplify wherever possible.

c. Eliminate the denominator. Multiply both sides of the equation by the expression in the denominator.

d. You will now try to isolate the variable t on one side of the equation. Divide both sides by 800.

e. Add 1 to both sides of the equation.

f. You now should have an exponential equation in standard form. Apply the One-To-One Property by taking the common log of both sides of the equation.

g. Apply the Power Property to remove the exponent.

h. Solve for t. Round your answer to the nearest tenth. Your result should match the answer in exercise 11.

Name _____ Date _____

12. In **a–h** below, write the equations that result when you follow the steps to use the systematic withdrawal formula, $P = W\dfrac{1-(1+\frac{r}{n})^{-nt}}{\frac{r}{n}}$ to determine how long it will take for a savings account to reach \$0. The account was set up with an initial deposit of \$8000. Interest is compounded monthly at 1.2% with a monthly withdrawal of \$400.

a. Substitute $P = 8{,}000$, $W = 400$, $r = .012$, and $n = 12$ in the systematic withdrawal formula.

b. Simplify wherever possible.

c. Divide both sides by 400.

d. Multiply both sides by .001.

e. Subtract 1 from both sides.

f. Divide both sides by –1.

g. Take the log of both sides (One-To-One Property).

h. Apply the Power Property.

i. Divide both sides by log(1.001).

j. Divide both sides by –12.

k. Simplify.

13. Burt deposited \$100,000 into an account that compounds interest semiannually at a rate of 2.66%. At the end of each 6-month period, a withdrawal of \$8000 is made from the account. How long will it take until the account has a balance of \$0? Round your answer to the nearest tenth of a year.

Name _____ Date _____

3-1 Introduction to Consumer Credit

Exercises

1. Monique purchases a $5,100 dining room set. She can't afford to pay cash, so she uses the installment plan, which requires an 18% down payment. How much is the down payment?

2. Joe wants to purchase an electric keyboard. The price of the keyboard at Macelli's, with tax, is $2,344. He can save $150 per month. How long will it take him to save for the keyboard?

3. Lisa purchases a professional racing bicycle that sells for $3,000, including tax. It requires a $200 down payment. The remainder, plus a finance charge, is paid back monthly over the next $2\frac{1}{2}$ years. The monthly payment is $111.75. What is the finance charge?

4. The price of a stove is s dollars. Pedro makes a 10% down payment for a two-year installment purchase. The monthly payment is m dollars. Express the finance charge algebraically.

5. Depot Headquarters has a new promotional payment plan. All purchases can be paid off on the installment plan with no interest, as long as the total is paid in full within 12 months. There is a $25 minimum monthly payment required. If the Koslow family buys a hot tub for $4,355, and they make only the minimum payment for 11 months, how much will they have to pay in the 12th month?

6. The White family purchases a new pool table on a no-interest-for-one-year plan. The cost is $2,665. There is a d dollars down payment. If they make a minimum monthly payment of m dollars until the last month, express their last month's payment algebraically.

7. Snow-House sells a $1,980 snow thrower on the installment plan. The installment agreement includes a 20% down payment and 12 monthly payments of $161 each.

a. How much is the down payment?

b. What is the total amount of the monthly payments?

c. What is the total cost of the snow thrower on the installment plan?

d. What is the finance charge?

8. Carey bought a $2,100 computer system on the installment plan. He made a $400 down payment, and he has to make monthly payments of $79.50 for the next two years. How much interest will he pay?

Name _____ Date _____

9. Mike bought a set of golf clubs that cost k dollars. He signed an installment agreement requiring a 5% down payment and monthly payments of g dollars for $1\frac{1}{2}$ years.

a. Express his down payment algebraically.

b. How many monthly payments must Mike make?

c. Write expressions for the total amount of the monthly payments and the finance charge.

10. Mrs. Grudman bought a dishwasher at a special sale. The dishwasher regularly sold for $912. No down payment was required. Mrs. Grudman has to pay $160 for the next six months. What is the average amount she pays in interest each month?

11. The Hut sells a $2,445 entertainment system credenza on a six-month layaway plan.

a. If the monthly payment is $440, what is the sum of the monthly payments?

b. What is the fee charged for the layaway plan?

c. Where is the credenza kept during the six months of the layaway plan?

12. Jessica has $70,000 in the bank and is earning 1.7% compounded monthly. She plans to purchase a used car, for which the down payment is $500 and the monthly payments are $280.

a. Will her monthly interest cover the cost of the down payment? Explain.

b. Will her monthly interest cover the cost of the monthly payment?

13. Joseph purchased a laptop that regularly sold for w dollars but was on sale at 10% off. He had to pay t dollars for sales tax. He bought it on the installment plan and had to pay 15% of the total cost with tax as a down payment. His monthly payments were m dollars per month for three years.

a. Write expressions for the amount of the discount and the sale price.

b. Write expressions for the total cost of the laptop, with tax, and the down payment.

c. What was the total of all of the monthly payments? What was the total he paid for the laptop on the installment plan?

d. What was the finance charge?

Name _____ Date _____

3-2 Loans

Exercises

Round to the nearest cent wherever necessary.

1. Refer to the table to find the monthly payments necessary to complete parts a–e.

a. What is the monthly payment for a $3,200 five-year loan with an APR of 3%?

b. Mia borrows $66,000 for four years at an APR of 4%. What is the monthly payment?

c. What is the total amount of the monthly payments for a $6,100, two-year loan with an APR of 5%? Round to the nearest dollar.

Monthly Payment Per $1,000 of Loan

Interest Rate (APR)	2-Year Loan	3-Year Loan	4-Year Loan	5-Year Loan
1%	$42.10	$28.21	$21.26	$17.09
2%	$42.54	$28.64	$21.70	$17.53
3%	$42.98	$29.08	$22.13	$17.97
4%	$43.42	$29.52	$22.58	$18.42
5%	$43.87	$29.97	$23.03	$18.87
6%	$44.32	$30.42	$23.49	$19.33
7%	$44.77	$30.88	$23.95	$19.80

d. The total of monthly payments for a three-year loan is $22,317.12. The APR is 4%. How much money was originally borrowed?

e. What is the finance charge for a $7,000, two-year loan with a 6% APR?

2. Ray borrows b dollars over a $2\frac{1}{2}$-year period. The monthly payment is m dollars. Express his finance charge algebraically.

3. Cecilia bought a new car. The total amount she needs to borrow is $29,541. She plans to take out a four-year loan at an APR of 6.3%. What is the monthly payment?

4. Claire needs to borrow $12,000 from a local bank. She compares the monthly payments for a 5.1% loan for three different periods of time. What is the monthly payment for a one-year loan? A two-year loan? A five-year loan?

5. The Star Pawnshop will lend up to 45% of the value of a borrower's collateral. Ryan wants to use $4,000 worth of jewelry as collateral for a loan. What is the maximum amount that he could borrow from Star?

6. Solomon is taking out a loan of x dollars for y years, which has a monthly payment of m dollars. Express the finance charge for this loan algebraically.

Name _____ Date _____

7. Jeanne has a $14,800, $3\frac{1}{2}$-year loan with a high APR of 8.56% due to her less-than-average credit rating.

a. What is the monthly payment for this loan?

b. If she changes the loan to a three-year loan, what is the monthly payment?

c. What is the difference in the monthly payments for the two loans?

d. Which loan has the higher finance charge? What is the difference in the finance charge for these two loans?

e. Do you feel that it is worth paying the higher monthly payment to have the loan finish six months earlier?

8. Liz found an error in the monthly payment her bank charged her for a four-year, $19,500 loan. She took the loan out at an APR of 5%. Her bank was charging her $459.07 per month.

a. What is the correct monthly payment?

b. Liz noticed the error just before making the last payment. The bank told her that they would credit all of the overpayments and adjust her last month's payment accordingly. What should her last month's payment be after the adjustment? Explain.

9. The Bartolotti family took out a loan to have a garage built next to their house. The 10-year, 10.4% loan was for $56,188. The monthly payment was $475, but the promissory note stated that there was a balloon payment at the end.

a. How many monthly payments do the Bartolotti's have to make?

b. What is the sum of all but the last monthly payment?

c. If the finance charge is $34,415.60, what must the total of all of the monthly payments be?

d. What is the amount of the balloon payment for the final month of this loan?

10. Christina is a police officer, so she can use the Police and Fire Credit Union. The credit union will lend her $11,000 for three years at 4.05% APR. The same loan at her savings bank has an APR of 6.82%.

a. How much would Christina save on the monthly payment if she takes the loan from the credit union?

b. How much would she save in finance charges by taking the loan from the credit union?

Name _____ Date _____

3-3 Student Loans

Use the following situation to answer questions 1–5.

Marlie will be starting college next month. She was approved for a 10-year, Federal Unsubsidized student loan in the amount of $18,800 at 4.29%. She knows she has the option of beginning repayment of the loan in 4.5 years. She also knows that during this non-payment time, interest will accrue at 4.29%.

1. How much interest will Marlie accrue during the 4.5-year non-payment period?

2. Marlie has to decide whether she can afford to make interest-only payments for the first 4.5 years or defer all payments for that period of time. If she decides to make no payments during the 4.5 years, the interest will be capitalized at the end of that period. Suppose Marlie decides to defer the payments.

a. What will be the new principal when she begins making loan payments?

b. How much interest will she pay over the life of the loan?

3. Suppose Marlie only paid the interest during her 4 years in school and the six-month grace period. What will she now pay in interest over the term of the loan?

4. Marlie made her last monthly interest-only payment on December 1. Her next payment is due on January 1. What will be the amount of that interest-only payment?

5. Suppose that Marlie had decided to apply for a private loan rather than a federal loan. She has been offered a private loan for 10 years with an APR of 7.8%.

a. Determine her monthly payment.

b. What is the total amount she will pay back?

c. What is the total interest amount?

Name _____ Date _____

6. Jim's parents paid for the first three years of his college costs. When he was a college senior, he was approved for an unsubsidized loan in the amount of $15,200 at a 4.29% interest rate for 10 years.

a. If he chooses to make interest-only payments until the monthly loan payments are due, for how long will he be making interest only payments?

b. What is the total amount of his interest-only payments?

c. If he begins the loan repayment with no interest capitalization because he already paid the interest when he was in school and during the six-month grace period, how much will he have paid in interest for this loan by the end of the 10-year loan period?

7. Barb is a freshman attending a 4-year college. She has been approved for a $12000 subsidized federal loan at 4.29% for 10 years. How much will the U.S. Department of Education pick up in interest costs during her 4.5-year non-payment period?

Use the following situation to answer questions 8–12.

Phil has been accepted into a 2-year Radiology Technician Program at a career school. He has been awarded a $9000 unsubsidized 10-year federal loan at 4.29%. He knows he has the option of beginning repayment of the loan in 2.5 years. He also knows that during this non-payment time, interest will accrue at 4.29%.

8. How much interest will Phil accrue during the 2.5-year non-payment period?

9. If Phil decides to make no payments during the 2.5 years, the interest will be capitalized at the end of that period. What will be the new principal when he begins making loan payments?

10. Suppose Phil only paid the interest during his 2 years in school and the six-month grace period. What will he pay in interest over the term of his loan?

11. Phil made his last monthly interest-only payment on April 12. His next payment is due on May. What will be the amount of that interest-only payment?

12. Suppose that Phil had decided to take out a private loan for $9,000 where loan payments start as soon as the loan amount is deposited in his student account and continue for 10 years. The interest rate is 8.1%.

a. Determine his monthly payment.

b. What is the total amount he will pay back?

c. What is the total interest amount?

Name _____ Date _____

3-4 Loan Calculations and Regression

Exercises

1. What is the monthly payment for a 10-year, $20,000 loan at 4.625% APR? What is the total interest paid on this loan?

2. Max is taking out a 5.1% loan in order to purchase a $17,000 car. The length of the loan is five years. How much will he pay in interest?

3. Merissa wants to borrow $12,000 to purchase a used boat. After looking at her monthly budget, she realizes that all she can afford to pay per month is $250. The bank is offering a 6.1% loan. What should the length of her loan be so that she can keep within her budget? Round to the nearest year.

4. What is the total interest on a 15-year, 4.98% loan with a principal of $40,000?

5. Ansel wants to borrow $10,000 from the Hampton County Bank. They offered him a 6-year loan with an APR of 6.35%. How much will he pay in interest over the life of the loan?

6. Tom and Kathy want to borrow $35,000 in order to build an addition to their home. Their bank will lend them the money for 12 years at an interest rate of $5\frac{3}{8}$%. How much will they pay in interest to the bank over the life of the loan?

Use the Yearly Payment Schedule to answer Exercises 7–10.

Year	Principal Paid	Interest Paid	Loan Balance	Year	Principal Paid	Interest Paid	Loan Balance
							$76,000.00
2016	$3,702.31	$3,158.45	$72,297.69	2024	$5,198.46	$1,662.30	$36,279.09
2017	$3,862.78	$2,997.98	$68,434.91	2025	$5,423.74	$1,437.02	$30,855.35
2018	$4,030.18	$2,830.58	$64,404.73	2026	$5,658.80	$1,201.96	$25,196.55
2019	$4,204.85	$2,655.91	$60,199.88	2027	$5,904.04	$956.72	$19,292.51
2020	$4,387.07	$2,473.69	$55,812.81	2028	$6,159.90	$700.86	$13,132.61
2021	$4,577.18	$2,283.58	$51,235.63	2029	$6,426.88	$433.88	$6,705.73
2022	$4,775.56	$2,085.20	$46,460.07	2030	$6,705.73	$157.40	$0.00
2023	$4,982.52	$1,878.24	$41,477.55				

7. What is the loan amount?

8. What is the length of the loan?

9. What is the monthly payment?

10. What is the total interest over the loan's life?

Name _____ Date _____

11. Neville is considering taking out a $9,000 loan. He went to two lending institutions. Sunset Park Company offered him a 10-year loan with an interest rate of 5.2%. Carroll Gardens Bank offered him an 8-year loan with an interest rate of 6.6%. Which loan will have the lowest interest over its lifetime?

12. JFK Federal Bank offers a $50,000 loan at an interest rate of 4.875% that can be paid back over 3 to 15 years.

a. Write the monthly payment formula for this loan situation. Let *t* represent the number of years from 3 to 15 inclusive.

b. Write the total interest formula for this loan situation. Let *t* represent the number of years from 3 to 15 inclusive.

Use the table of decreasing loan balances for a $230,000 loan at 5.5% for 20 years to answer questions 13–15.

13. Write a linear regression equation that models the data with numbers rounded to the nearest tenth.

14. Write a quadratic regression equation that models the data with numbers rounded to the nearest tenth.

15. Write a cubic regression equation that models the data with numbers rounded to the nearest tenth.

	Loan Balance
0	$230,000.00
1	$223,502.14
2	$216,637.75
3	$209,386.16
4	$201,725.52
5	$193,632.76
6	$185,083.51
7	$176,052.02
8	$166,511.07
9	$156,431.94
10	$145,784.26
11	$134,535.97
12	$122,653.20
13	$110,100.15
14	$96,839.02
15	$82,829.83
16	$68,030.43
17	$52,396.21
18	$35,880.12
19	$18,432.38
20	$0.00

Name _____ Date _____

3-5 Credit Cards

Exercises

Round to the nearest cent wherever necessary.

1. If the APR on a credit card is 22.2%, what is the monthly interest rate?

2. If the monthly interest rate on a credit card is *p* percent, express the APR algebraically.

3. The average daily balance for Dave's last credit card statement was $1,213.44, and he had to pay a finance charge. The APR is 20.4%. What is the monthly interest rate? What is the finance charge for the month?

4. Mr. Reis had these daily balances on his credit card for his last billing period. He did not pay the card in full the previous month, so he will have to pay a finance charge. The APR is 19.8%.

six days @ $341.22 ten days @ $987.45
three days @ $2,122.33 eleven days @ $2,310.10

a. What is the average daily balance?

b. What is the finance charge?

5. Mrs. Fagin's daily balances for the past billing period are given below.

For five days she owed $233.49. For three days she owed $651.11.
For nine days she owed $991.08. For seven days she owed $770.00.
For seven days she owed $778.25.

Find Mrs. Fagin's average daily balance.

6. Mike Bauer had a daily balance of *x* dollars for *d* days, *y* dollars for 9 days, *r* dollars for 4 days, and *m* dollars for 5 days. Express his average daily balance algebraically.

7. Mrs. Cykman's credit card was stolen, and she did not realize it for several days. The thief charged a $440 watch while using it. According to the Truth-in-Lending Act, at most how much of this is Mrs. Cykman responsible for paying?

8. Mr. Kramden's credit card was lost on a vacation. He immediately reported it missing. The person who found it days later used it and charged *c* dollars worth of merchandise on the card, where $c > \$50$. How much of the *c* dollars is Mr. Kramden responsible for paying?

9. The average daily balance for Pete's credit card last month was *a* dollars. The finance charge was *f* dollars. Express the APR algebraically.

Name _____ Date _____

10. Brett and Andy applied for the same credit card from the same bank. The bank checked both of their FICO scores. Brett had an excellent credit rating, and Andy had a poor credit rating.

a. Brett was given a card with an APR of 12.6%. What was his monthly percentage rate?

b. Andy was given a card with an APR of 16.2%. What was his monthly percentage rate?

c. If each of them had an average daily balance of $7,980, and had to pay a finance charge for that month, how much more would Andy pay than Brett?

11. A set of daily balances for one billing cycle are expressed algebraically below.

w days @ *r* dollars 5 days @ *x* dollars *n* days @ *q* dollars *p* days @ $765

If the APR is 21.6%, express the billing cycle's finance charge algebraically.

12. Mrs. Imperiale's credit card has an APR of 13.2%. She does not ever pay her balance off in full, so she always pays a finance charge. Her next billing cycle starts today. The billing period is 31 days long. She is planning to purchase $7,400 worth of new kitchen cabinets this billing cycle. She will use her tax refund to pay off her entire bill next month. If she purchases the kitchen cabinets on the last day of the billing cycle instead of the first day, how much would she save in finance charges? Round to the nearest ten dollars.

13. Pat's ending balance on his debit card last month was $233.55. This month he had $542 worth of purchases and $710 worth of deposits. What is his ending balance for this month?

14. Tomika's credit rating was lowered, and the credit card company raised her APR from 18% to 25.2%.

a. If her average daily balance this month is $8,237, what is the increase in this month's finance charge due to the higher APR?

b. If this amount is typical of Tomika's average daily balance all year, how much would the rise in interest rate cost her in a typical year? Round to the nearest ten dollars.

15. Linda and Rob charged a $67.44 restaurant bill on their credit card. They gave the card to the waitress, who accidentally transposed two digits and charged them $76.44. They did not notice this until they received their statement later that month. Their card has an 18% APR.

a. How much were Linda and Rob overcharged?

b. They plan to pay their monthly statement amount in full, but they need to deduct the amount they were overcharged, plus the finance charge that was based on the incorrect amount. If the overcharged amount was on their statement for 18 of the 31-day billing cycle, how much should they deduct from this monthly statement, including the amount they were overcharged?

Name _____ Date _____

3-6 Credit Card Statement

Exercises

1. The summary portion of Manny Ramira's credit card statement is shown. Determine the new balance amount.

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	1,237.56	$1,200.00	$2,560.67	$0.00	$9.56		

2. Lizzy has a credit line of $9,000 on her credit card. Her summary is shown. What is her available credit balance?

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$6,500.56	$5,200.00	$978.45	$20.00	$12.88		

3. Rich had a previous balance of x dollars and made an on-time credit card payment of y dollars where $y < x$. He has a credit line of 10,000 dollars and will have to pay $15.50 in finance charges. Rich made purchases totaling $1,300.30. Write an algebraic expression that represents his current available credit.

4. Determine the error that was made using the following summary statement.

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$350.90	$200.00	$200.00	$0.00	$8.68	$759.58	

5. Marianne has a credit card with a line of credit at $15,000. She made the following purchases: $1,374.90, $266.21, 39.46, and $903.01. What is Marianne's available credit?

6. Luke has a credit line of $8,500 on his credit card. He had a previous balance of $4,236.87 and made a $3,200.00 payment. The total of his purchases is $989.42. What is Luke's available credit?

7. The APR on Ramona's credit card is currently 24.6%. What is the monthly periodic rate?

8. Sheila's monthly periodic rate is 2.41%. What is her APR?

9. Examine the summary section of a monthly credit card statement. Calculate the new balance.

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$876.34	$800.00	$1,009.56	$30.00	$29.67		$18.00

Name _____ Date _____

10. Jack set up a spreadsheet to model his credit card statement. The summary statement portion of the spreadsheet is shown. Write the formula for available credit that would be entered in cell J32.

	D	E	F	G	H	I	J
31	**Previous Balance**	**Payments**	**New Purchases**	**Late Charge**	**Finance Charges**	**Credit Line**	**Available Credit**
32							

11. Use the credit card statement to answer the questions below.

Liam DeWitt
6915 Maple Creek Dr.
West Chester, OH

ACCOUNT INFORMATION

Account Number	4-10700000	Billing Date	13 Sept	**Payment Due**	30 Sept

TRANSACTIONS		DEBITS / CREDITS (–)
22 Aug	Propane Home Heat	$250.50
23 Aug	TJ Marsha's Department Store	$87.60
25 Aug	Brighton University	$1,300.00
1 Sept	Middle Island Auto Parts	$470.63
2 Sept	Payment	– $2,000.00
3 Sept	Al's Mobal Gas Station	$34.76
5 Sept	Stop, Shop and Go	$102.71
10 Sept	Federal Express	$45.90
12 Sept	Computer Depot	$848.60

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$3,240.50			$0.00			$50.00

		Average Daily Balance	# Days in Billing Cycle	APR	Monthly Periodic Rate
Total Credit Line	$ 5.000.00				
Total Available Credit	$ 5,000.00				
Credit Line for Cash	$ 4,000.00				
Available Credit for Cash	$ 4,000.00		30	19.8%	

a. How many purchases (debits) were made during the billing cycle?

b. What is the sum of all purchases (debits) made during the billing cycle?

c. When is the payment for this statement due?

d. What is the minimum amount that can be paid?

e. How many days are in the billing cycle?

f. What is the previous balance?

Name _____ Date _____

3-7 Average Daily Balance

Exercises

Use Liam DeWitt's Flash Card statement and the blank credit calendar for Exercises 1–4.

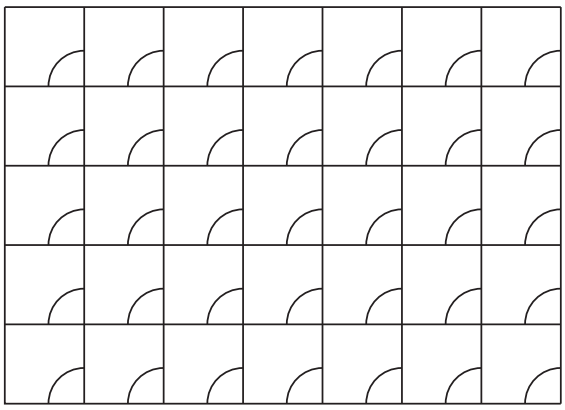
Liam DeWitt
6915 Maple Creek Dr.
West Chester, OH

ACCOUNT INFORMATION							
Account Number 4-10700000				Billing Date 13 Sept		**Payment Due** 30 Sept	
TRANSACTIONS						DEBITS / CREDITS (−)	
22 Aug	Propane Home Heat					$250.50	
23 Aug	TJ Marsha's Department Store					$87.60	
25 Aug	Brighton University					$1,300.00	
1 Sept	Middle Island Auto Parts					$470.63	
2 Sept	Payment					– $2,000.00	
3 Sept	Al's Mobal Gas Station					$34.76	
5 Sept	Stop, Shop and Go					$102.71	
10 Sept	Federal Express					$45.90	
12 Sept	Computer Depot					$848.60	

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$3,240.50			$0.00			$30.00

Total Credit Line	$ 5.000.00
Total Available Credit	$ 5,000.00
Credit Line for Cash	$ 4,000.00
Available Credit for Cash	$ 4,000.00

Average Daily Balance	# Days in Billing Cycle	APR	Monthly Periodic Rate
	30	19.8%	



1. What is Liam's average daily balance?

2. What is Liam's monthly periodic rate?

3. What is Liam's finance charge?

4. What is Liam's new balance?

5. What is Liam's available credit?

Name _____ Date _____

Use Shannon Houston's credit card statement and the blank calendar for Exercises 6–11.

Shannon Houston

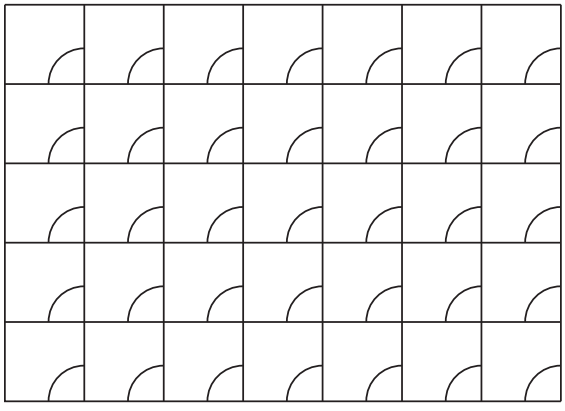
720 Timber Trail Dr
Indianapolis, IN

ACCOUNT INFORMATION					
Account Number	16677289-02	Billing Date	6 Apr	**Payment Due**	30 Apr

TRANSACTIONS		DEBITS / CREDITS ()
9 Mar	Gingham Pastry Shop	$27.68
11 Mar	Corner Clothes	$127.35
16 Mar	Le Petite Menu	$87.40
22 Mar	Payment	– $190.60
26 Mar	Dutchess Pharmacy	57.30
28 Mar	Sparrow Jewelers	$325.90
4 Apr	Elder's Antiques	$870.21

SUMMARY	Previous Balance	Payments / Credits	Transactions	Late Charge	Finance Charge	New Balance	**Minimum Payment**
	$560.30			$0.00			$25.00

		Average Daily Balance	# Days in Billing Cycle	APR	Monthly Periodic Rate
Total Credit Line	$ 5.000.00				
Total Available Credit					
Credit Line for Cash	$ 4,000.00				
Available Credit for Cash	$ 4,000.00		30	15.6%	



6. What amount should be in the box for "Payment/Credits"?

7. What amount should be in the box for "Transactions"?

8. What is Shannon's average daily balance?

9. What is Shannon's finance charge?

10. What is Shannon's new balance?

11. What is Shannon's available credit?