

**Chapter 1/3**

1. Write an equation in slope-intercept form of an arithmetic sequence with  $u_0 = 15$  and  $d = 6$ .

2. Write a recursive formula for each sequence:

- a. 3,9,15,21,...      b. 1.7,1.2,0.7,0.2,...      c. -7,-18,-29,-40,...      d. -7,-3,1,5,...

3. With the given information, find the equation of the line in point-slope form and intercept form.

- a. slope =  $\frac{2}{3}$ , passes through  $(-8,6)$       b. passes through  $(-2,6)$  and  $(2,-14)$   
c. passes through  $(0,5)$  and  $(7,0)$       d. parallel to  $3x+9y=2$ , passes through  $(6,-18)$   
e. perpendicular to  $-3x+y=5$ , passes through  $(-3,8)$       f. vertical line, passes through  $(4,5)$   
g. horizontal line, passes through  $(-9,12)$

4. Solve each system of equations. You are responsible to be able to use all 3 methods (substitution, elimination, graphing) and know when one method might be a better choice.

- a.  $y = \frac{1}{2}x + 6$       b.  $x - 9y = -27$       c.  $6x - 5y = 0$       d.  $-5x - 8y = -2$       e.  $0.5x + 1.5y = 5$   
 $y = \frac{11}{2}x - 4$        $-2x + 3y = 24$        $x - y = -1$        $-4x + 4y = -12$        $x + y = -10$

5. Solve each equation for the specified variable:

- a.  $b = -8 + \frac{3}{4}a$  for  $a = 40$       b.  $n = \frac{2}{3}p - 16$  for  $p = -9$

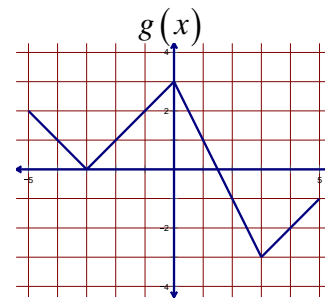
6. To raise funds, the Spartans Math Club sells two kinds of raffle tickets, gold tickets for \$6.00 each and silver tickets for \$1.50 each. If the club sold 371 tickets and raised \$822, how many of each kind of ticket were sold?

7. The health food store is making a fruit and nut mix with peanuts and raisins. The peanuts cost \$1.20/lb and the raisins cost \$2.10/lb. If they would like to make a 50lb mix that costs \$73.50, how many pounds of each are needed to create the mix?

## Chapter 4

1. Given the graph of  $g(x)$ , find:

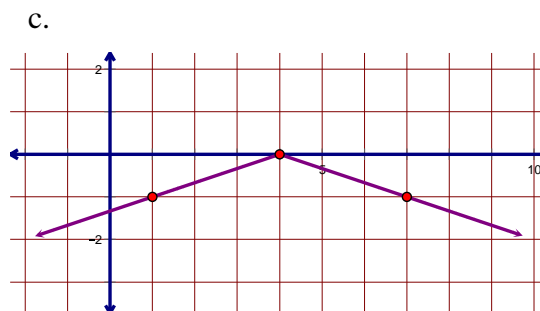
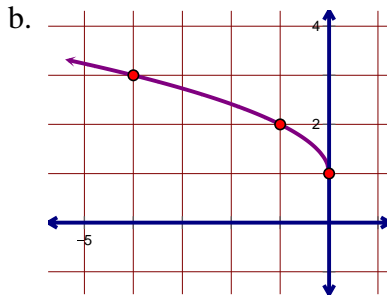
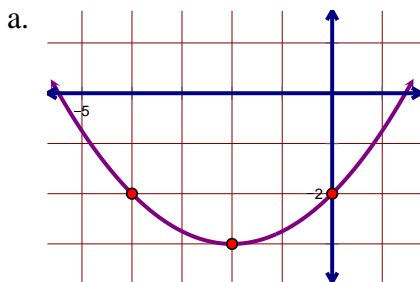
- a.  $g(2)$       b.  $g(-3)$       c.  $g(g(0))$   
 d.  $g(g(4))$       e.  $x$  when  $g(x)=1$       f.  $x$  when  $g(x)=-1$



2. For each equation, describe each transformation in words, sketch the graph, and state the domain and range.

- a.  $f(x) = 2|x+1|+3$       b.  $g(x) = -\frac{1}{2}\sqrt{x-2}-4$       c.  $h(x) = -2(x+5)^2 - 6$

3. Find the equation of each graph.



4. Given  $f(x) = x^2 + 5$ ,  $g(x) = 4x + 2$  and  $h(x) = \sqrt{x-1}$ , find:

- a.  $f(2)$       b.  $g(5)$       c.  $g(f(3))$       d.  $g(h(37))$       e.  $f(g(x))$       f.  $g(f(x))$

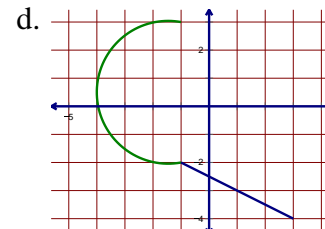
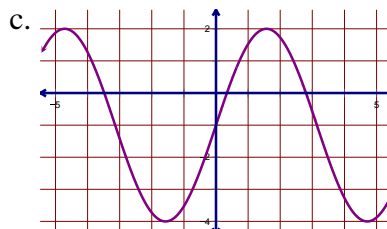
5. Determine whether each of the following is a function or not.

a.

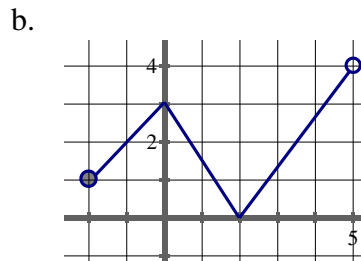
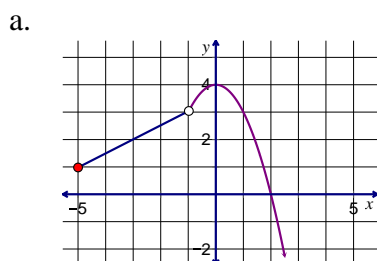
$x$	$y$
-2	7
0	5
-4	2
1	5

b.

$x$	$y$
1	2
-2	8
1	3
4	0



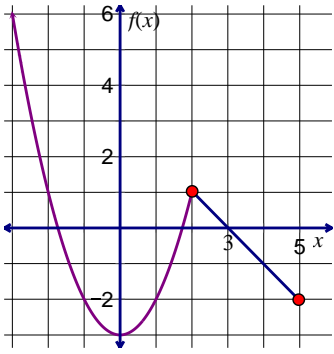
6. Find the domain and range of each graph.



7. Solve for  $x$ .

- a.  $2(x+9)^2 - 20 = 108$       b.  $4(x+1)^2 - 6 = 94$

8. Evaluate the expression or solve the equation.



$$g(x) = (x-1)^2 - 2$$

$x$	$h(x)$
-5	8
-1	2
0	8
2	2
-3	5

a.  $\frac{f(5)}{g(2)-h(-1)}$

b.  $g(f(1))$

c.  $f(h(-3))$

d.  $x$  when  $g(x) = 2$

e.  $x$  when  $h(x) = 8$

f.  $x$  when  $f(x) = -2$

### Chapter 5A

1. Given the sequence  $49, 7, 1, \frac{1}{7}, \dots$

a. Write a recursive formula.

b. Write the equation of the exponential function that contains these points.

2. Given the sequence  $2, 6, 18, \dots$

a. Write a recursive formula.

b. Write the equation of the exponential function that contains these points.

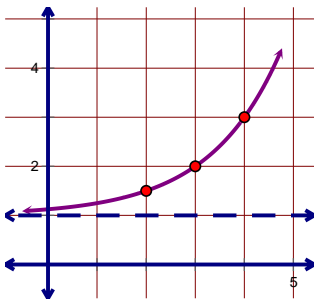
3. Susan is performing an experiment for her chemistry class. She begins with 300mg of sodium. In her experiment, she removes one third of the remaining amount of sodium from the container every ten minutes.

a. Write the recursive formula for this situation.

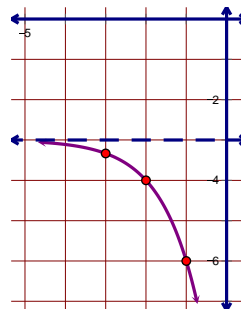
b. How much sodium will be left after 40 minutes?

4. Write the equation for the exponential function.

a. Base 2



b. Base 3



5. Describe the transformations of the parent function. Then graph the transformed function and state the domain and range.

a.  $a(x) = \left(\frac{1}{2}\right)^x + 8$

b.  $b(x) = -2^{x-1} + 6$

c.  $c(x) = 3^{\frac{x}{2}} - 1$

6. Simplify.

a.  $(-5)^{-3}$

b.  $(3xy)^2(4y^4)^{\frac{1}{2}}$

c.  $\left(\frac{c^3}{3^2}\right)^3$

d.  $\left(\frac{40a^8b}{-8a^3b^3}\right)^{-2}$

e.  $\left(\frac{16x^2y^3}{4x^5y}\right)^2 \cdot \frac{(5x^5)^0}{y^2}$

f.  $\sqrt[3]{128m^{10}n^{50}}$

7. Solve for  $x$ .

a.  $\sqrt[5]{x^3} = 27$

b.  $25^x = 125^{2x-5}$

c.  $2^x = \frac{1}{64}$

d.  $x^{\frac{3}{2}} = 8$

8. Rewrite in exponential or radical form.

a.  $\sqrt[7]{np^4}$

b.  $11^{\frac{2}{7}}$

c.  $\sqrt[20]{129}$

9. The value of a new truck is \$32,000 and loses 8.4% of its value each year. How much will the truck be worth in 3 years?

10. Find the equation of an exponential function that passes through the points (8,15) and (5,11).

11. An investment service promises to quadruple your money in 10 years. If you have \$1000 to invest, what is the annual interest rate (assuming annual compounding)?

12. Sally opens a bank account by depositing \$1250. If her account will earn 4.75% interest, compounded annually, what will her balance be after 8 years?

13. Find the equation of the exponential function that passes through the points (5,9.6) and (9,153.6).

14. Give the exact and rounded answer.

a.  $x^6 = 30$

b.  $\sqrt[8]{x^7} = 17$

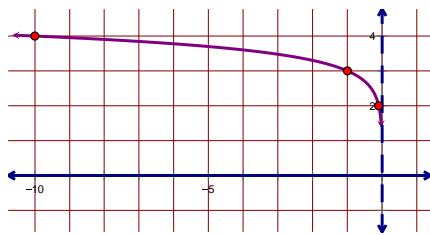
c.  $x^7 = 78$

d.  $\sqrt[4]{x^9} = 13$

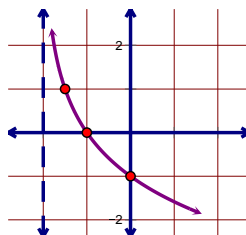
## Chapter 5B

1. Write the equation for the logarithmic graph.

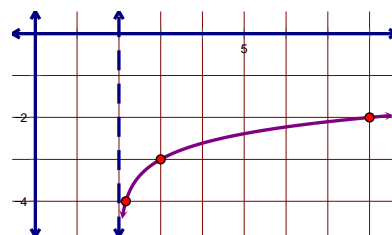
a. Base 10



b. Base 2



c. Base 6



2. Change to exponential or logarithmic form.

a.  $\log_w y = z$

b.  $a^b = c$

3. Evaluate.

a.  $\log 1000$

b.  $\log_2\left(\frac{1}{8}\right)$

c.  $\log 1$

d.  $\log_4 16$

e.  $\log\left(\frac{1}{100}\right)$

f.  $\log_5\left(\frac{1}{625}\right)$

4. Solve for  $x$ . Give the exact and approximate answers.

a.  $9^x = 13$

b.  $8^{x+5} = 42$

c.  $12^{x+3} = 162$

d.  $3(7)^{x-4} = 240$

5. Write as a single log.

a.  $\log_4 3 + 2\log_4 y$

b.  $2\log 5 - 2\log y$

c.  $\frac{1}{3}\log_x 27 - \log_x 16$

6. Expand with no exponents.

a.  $\log 5x^3$

b.  $\log_3\left(\frac{x^4}{5}\right)$

c.  $\log 6\sqrt{x}$

7. Find the inverse of the function.

a.  $f(x) = \frac{x}{7} - 2$

b.  $g(x) = \frac{6}{x-4}$

c.  $h(x) = \sqrt{2x-3} + 8$

8. Given  $f(x) = \frac{x+2}{3}$ , find  $f^{-1}(7)$

9. Joe currently pays a \$425 premium for health insurance. If the premium increases at an annual rate of 7.2% each year, how many years will it take for the premium to be \$1205.90?

10. You have \$2000 to invest in an account that earns 7.5% interest, compounded annually. Write an exponential equation to model the situation, then find when the account will be worth \$7500.

11. Graph.

a.  $a(x) = \log_3(x-4) - 2$

b.  $b(x) = -\log_2(x+3)$

c.  $c(x) = \log(-x) + 4$

## Chapter 6

1. Solve for  $x$ . Write each solution in interval notation and graph it on a number line.

a.  $5x - 8 > 11$

b.  $10 - 7x \geq 2x + 5$

c.  $|2x + 3| \leq 7$

d.  $|4 - d| \geq 9$

e.  $-2|x - 3| + 6 < -4$

f.  $|4r - 2| > 8$

g.  $|x| - 5 \leq 8$

h.  $|-3x - 13| < -4$

2. Graph the system of inequalities and label the vertices of the feasible region.

$x \leq 2$

a.  $-x + y > 5$

$x + 2y \geq 4$

b.  $y \geq 1$      $-x - 5y \leq -10$   
 $x < -4$      $x + y < -2$

3. A farmer has 60 acres for planting corn and beans. He wants to plant no more than 45 acres of corn and no more than 30 acres of beans. If the farmer makes a profit of \$550 per acre of corn and \$615 per acre of beans, how many acres of each vegetable should the farmer plant to make the maximum profit?

4. A small business produces oak desks and walnut desks. The business can make at most 20 desks per week. Materials cost \$300 per oak desk and \$150 per walnut chair. The business has a budget of \$3900 per week for materials. Each oak desk sells for \$425 and each walnut desk for \$510. How many of each type of desk should the business make each week to maximize their income?

