

Use a graphing calculator to find the solution(s) for the following systems of equations. Round answers to the hundredths place.

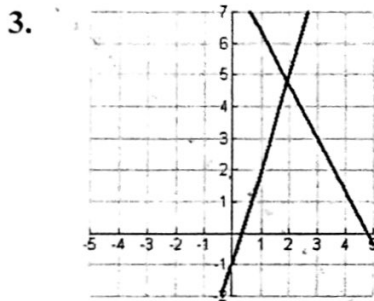
1.  $y = 8x - 6$

$y = \left(\frac{3}{4}\right)^x$   $(.848, .784)$

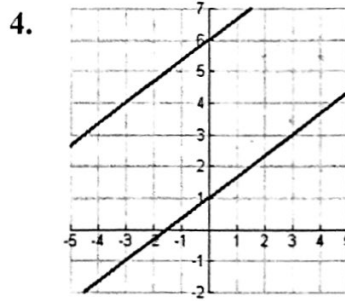
2.  $y = \frac{2}{5}x + 2$   $(-3.97, .41)$   
and

$y = \left(\frac{5}{4}\right)^x$   $(7.05, 4.82)$

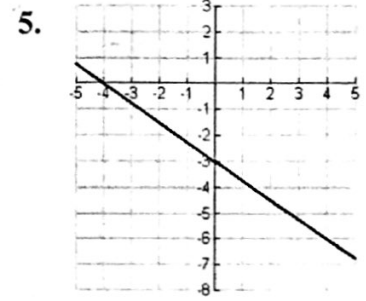
The graph of the system of two linear equations is shown. Tell whether the linear system has *infinitely many solutions*, *one solution*, or *no solution*.



one solution



NO SOLUTION



∞ many

Check whether the ordered pair is a solution of the system.

6.  $(-3, -4)$

$4x - 7y = 16$

$-6x + y = 14$

yes

Solve the system using any algebraic method.

7.  $x + y = 2$

$y = 2x + 5$

$(-1, 3)$

8.  $2x - y = -8$

$2x + y = 4$

$(-1, 6)$

9.  $10x - 16y = 17$

$x + y = 3$

$(2.5, .5)$

10.  $-5x - 6y = 3$

$3x - 8y = -7$

$\left(-\frac{33}{29}, \frac{13}{29}\right)$

Solve the system using any algebraic method.

11.  $-2x + 2y = -5$   
 $x + y = -5$

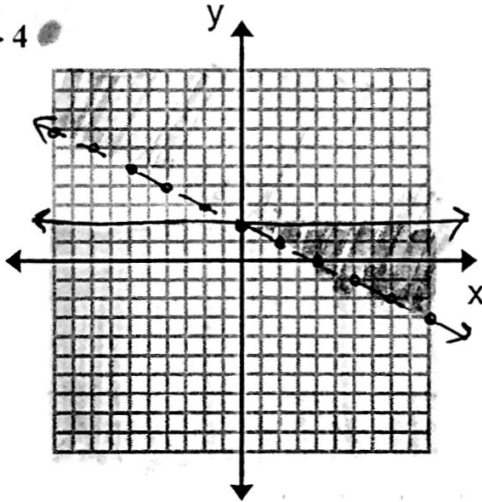
$\left(\frac{-5}{4}, \frac{-15}{4}\right)$

12.  $3x - 8y = 11$   
 $-6x + 16y = -5$

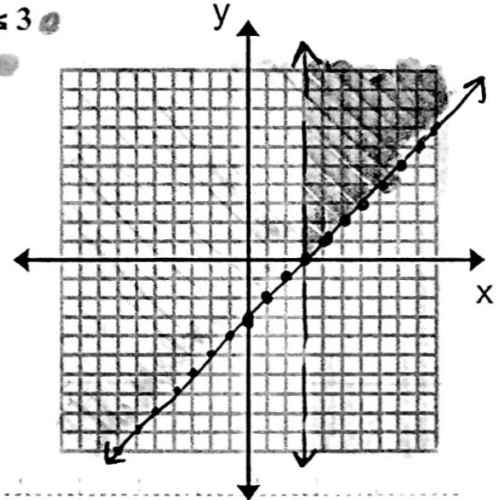
No SOLUTION

Graph the system of linear inequalities.

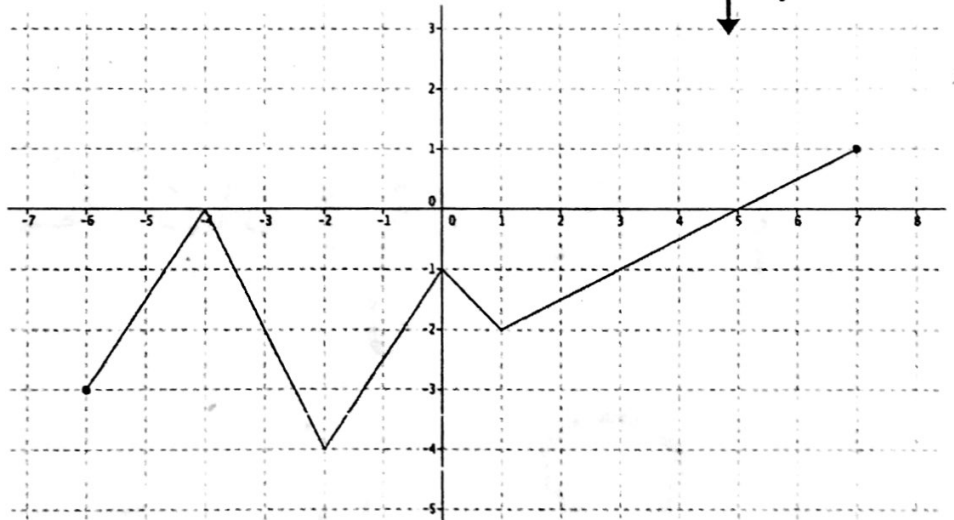
13.  $x + 2y > 4$   
 $y \leq 2$



14.  $x - y \leq 3$   
 $x > 3$



15. Describe the features of the function using INTERVAL NOTATION.



Domain:  $[-6, 7]$  Range:  $[-4, 1]$

Increasing:  $(-6, -4)$   $(-2, 0)$   $(1, 7)$  Decreasing:  $(-4, -2)$   $(0, 1)$

Positive:  $(5, 7]$  Negative:  $[-6, -4)$   $(-4, 5)$

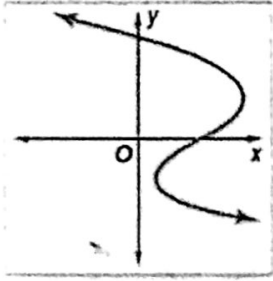
x-intercept(s):  $f(-4) = 0$   $\wedge$   $f(5) = 0$  y-intercept(s):  $f(0) = -1$

Maximum:  $f(7) = 1$  Minimum:  $f(-2) = -4$

Is this a function? yes Continuity: Continuous

Are the following functions? Explain why or why not.

16.



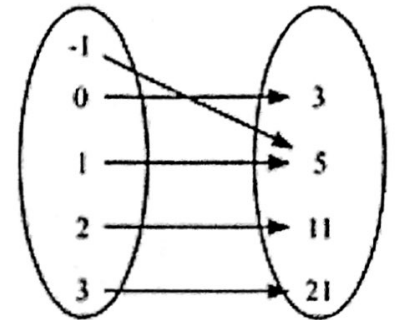
No, fails the vertical line test

17.  $\{(-4,3), (5,3), (-2,1), (-7,1)\}$

Yes,  
each x value  
has exactly  
1 y value.

18. Domain

Range



Yes, each # in the Domain goes to 1 # in the Range.

Use  $f(x) = 3x - 4$ ,  $g(x) = x^2 + 5$ ,  $h(x) = 6^x$ , and  $j(x) = 2 + 3^x$  to answer the following questions.

19.  $f(-5) = -19$

20.  $g(-5x) = 25x^2 + 5$

21.  $h(-3) = \frac{1}{216}$

22.  $h(2) + 15 = 51$

23.  $f(7) - g(3) = 3$

24.  $h(-2) \cdot f(-4) = -\frac{4}{9}$

25.  $j(5) = 245$

26. a. You are in charge of buying the hamburger and chicken for a party. You have \$60 to spend. The hamburger costs \$2 per pound and chicken is \$3 per pound. Write an equation that represents the different amounts of hamburger,  $x$ , and chicken,  $y$ , that you can buy.

$$2x + 3y = 60$$

b. If you buy 15 pounds of hamburger, how many pounds of chicken can you buy?

10 pounds

27. a. You are buying \$48 worth of lawn seed that consists of two types of seed. One type is a quick-growing rye grass that costs \$4 per pound, and the other type is a higher-quality seed that costs \$6 per pound. Write an equation that represents the different amounts of \$4 seed,  $x$ , and \$6 seed,  $y$ , that you can buy.

$$4x + 6y = 48$$

- b. If you buy 3 pounds of quick-growing rye grass, how many pounds of the higher-quality seed can you buy?

6 pounds

28. Cami purchased a rare coin from a dealer for \$300. The value of the coin increases 5% each year.

- a) Write an explicit equation

$$y = 300(1.05)^x$$

- b) How much will the coin be worth in 5 years? (Round to the nearest hundredth.)

\$382.88

29. In the years from 2010 to 2015, the population of the District of Columbia is expected to decrease about 0.9% annually. In 2010, the population was about 530,000.

- a) Write an explicit equation.

$$y = 530,000(0.991)^x$$

- b) What is the population expected to be in 2015?

(Round to the nearest whole number.)

506,575 people

Solve the following equations for  $y$ . Put the answers in slope-intercept form.

30.  $-3x + 6y = 24$  for  $y$

$$y = \frac{1}{2}x + 4$$

31.  $2x - 5y = 15$  for  $y$

$$y = \frac{2}{5}x - 3$$

32.  $-4x - 6y = 10$  for  $y$

$$y = -\frac{2}{3}x - \frac{5}{3}$$

33.  $9x + 12y = -12$  for  $y$

$$y = -\frac{3}{4}x - 1$$

34. Your extended family is having a reunion, and your family is in charge of getting the food for the dinner. You have \$900.00 to spend on lasagnas and sides (salads, bread sticks, desserts, etc.). Store A offers you lasagnas for \$12.00 each and \$9.00 for each side dish. Store B offers you lasagnas for \$18.00 each and \$6.00 for each side dish.

The equations are provided. Use a graphing calculator to graph the equations and then answer the questions that follow.

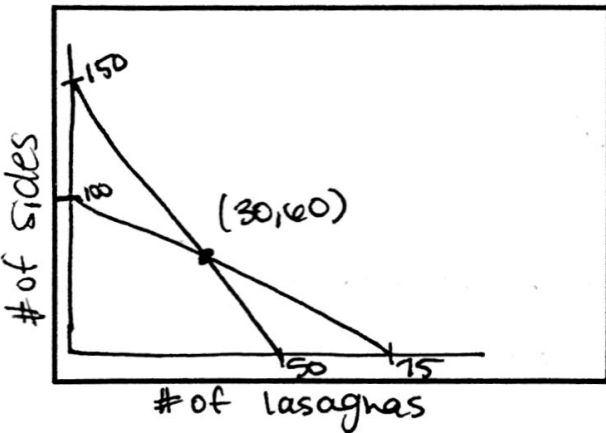
Equations:

Store A:  $12x + 9y = 900$

Store B:  $18x + 6y = 900$

Table: (go from y- intercept to x-intercept and use only whole number ordered pairs)

Graph: Label axes, lines, intercepts and intersection point.



Equation 1  
Ordered Pairs

Equation 2  
Ordered Pairs

(0, 100)

(0, 150)

( , )

( , )

(30, 60)

(30, 60)

( , )

( , )

(75, 0)

(50, 0)

One Other  
Whole # Point

Intersection Pt

One Other  
Whole # Point

a) What is coordinate of intersection? (30, 60)

b) What does the intersection point mean in context of the story?

You can get 30 lasagnas & 60 side dishes at either store & spend all \$900.00.

c) If you decide your family needs to buy 40 lasagnas, which store should you go with so you can get the most number of side dishes within your budget?

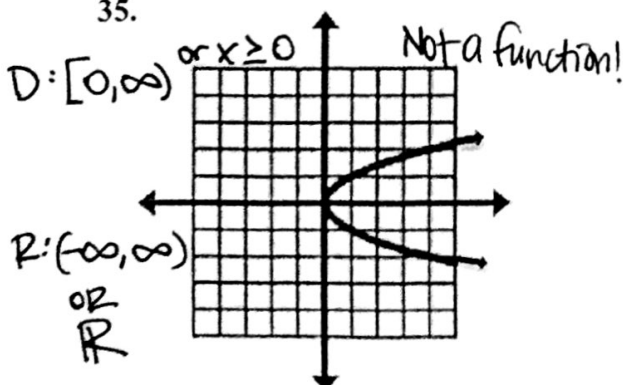
Store A

d) If you decide your family needs to buy 80 different side dishes, which store should you go with so you can get the most number of lasagnas within your budget?

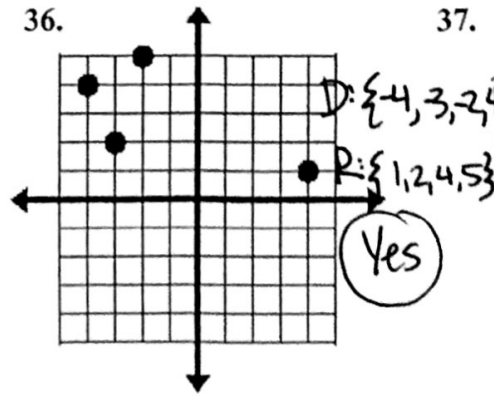
Store B

#35-37: Identify the domain and range of each relation and state whether or not it is a function.

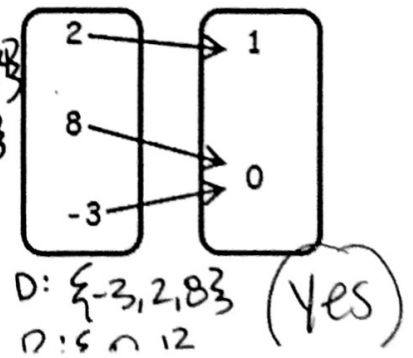
35.



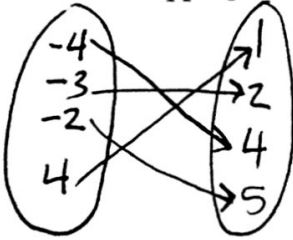
36.



37.



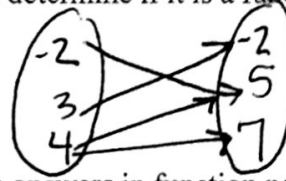
38. Create a mapping for #36.



39. Create a mapping for

$$\{(4,5), (3,-2), (-2,5), (4,7)\}$$

and determine if it is a function.



Not a function

40. Evaluate  $f(x) = x^2 + 3$  given the domain  $\{-2, 0, 1, 2\}$ . Write answers in function notation.

$$f(-2) = 7$$

$$f(0) = 3$$

$$f(1) = 4$$

$$f(2) = 7$$

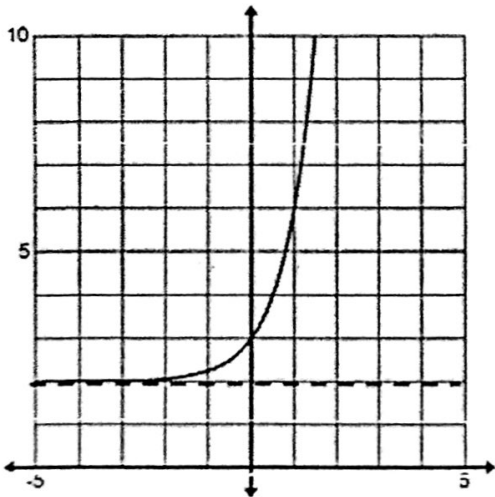
41. If  $f(x) = 4^x + 10$ , what is  $f(2)$ ?

$$f(2) = 26$$

42. If  $g(x) = 5x^3 + 2$ , what is  $g(1.5)$ ?

$$g(1.5) = 18.875$$

43. Is the graph below a function? Yes Why or why not? passes the vertical line test



Domain:  $(-\infty, \infty)$  or  $\mathbb{R}$

Range:  $(2, \infty)$  or  $\mathbb{R}$

Increasing or Decreasing

Positive or Negative

x-intercept: None

y-intercept:  $f(0) = 3$

Continuous or Discrete

What is the equation of the curve shown?  $y = 3^x + 2$

Write an equation of the line.

44. parallel to  $y = -2x + 13$  with a y-intercept of 8.

$$y = -2x + 8$$

45. perpendicular to  $y = \frac{1}{5}x + 6$  with a

y-intercept of -9

$$y = -5x - 9$$

46. Line  $j$  is parallel to the line with the given equation and line  $j$  passes through  $P$ .  
Write the equation of line  $j$ .  $y = -5x + 27$ ,  $P(-4, 2)$

$$y = -5x - 18$$

47. Line  $k$  is perpendicular to the line with the given equation and line  $k$  passes through  $P$ .  
Write the equation of line  $k$ .  $y = -7x + 11$ ,  $P(3, 0)$

$$y = \frac{1}{7}x - \frac{3}{7}$$

48. Write the equation of the line that passes through  $(4, -1)$  and is parallel to the line  $x = -6$ .

$$x = 4$$

49. Write an equation of the line that passes through  $(4, 6)$  and is perpendicular to the line that passes through  $(6, -6)$  and  $(10, -4)$

$$y = -2x + 14$$

Match each equation with the correct graph.

50.  $y = (0.25)^x$

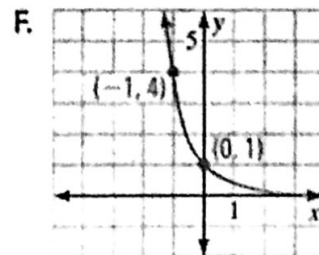
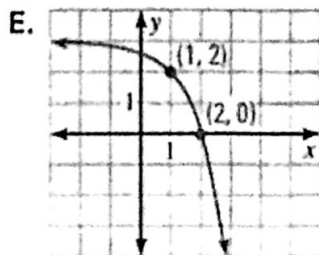
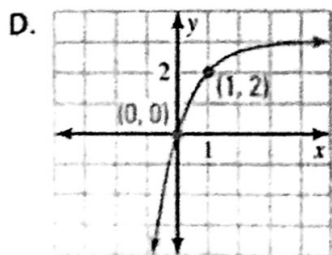
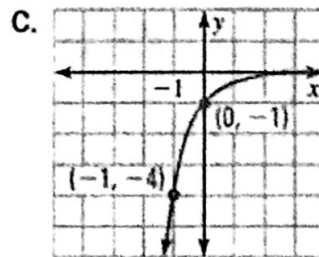
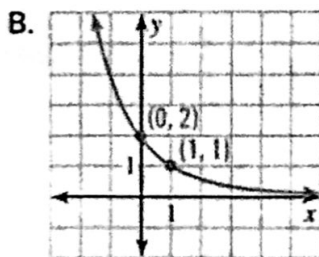
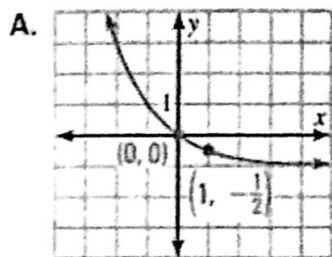
F

51.  $y = -(0.25)^x$

C

52.  $y = (0.5)^x - 1$

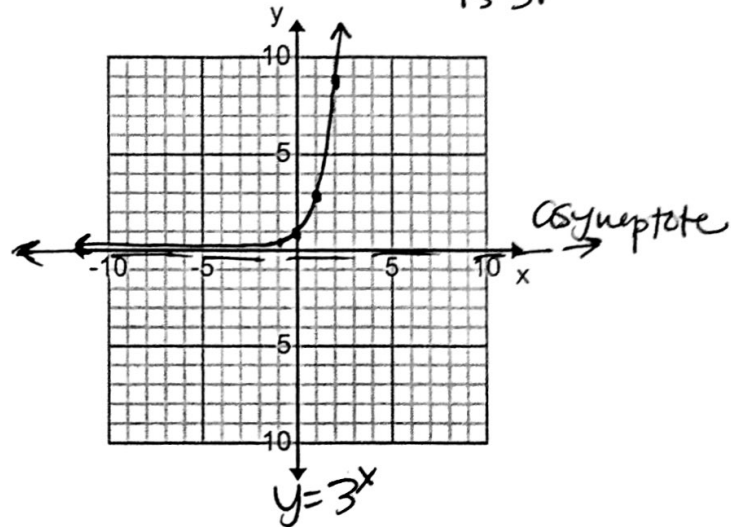
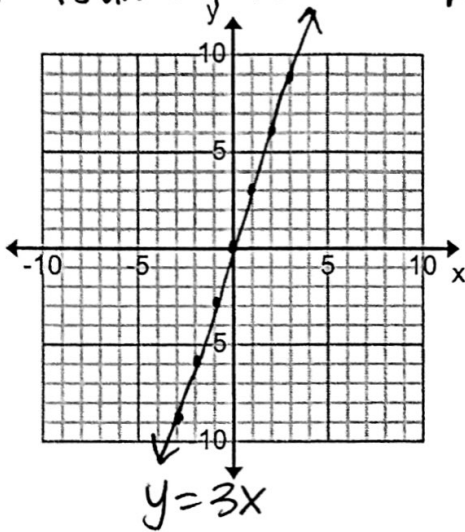
A



53. Explain the differences between the graphs of  $y = 3x$  and  $y = 3^x$ , then graph both equations below.  
(Label each graph with the equation graphed)

$y = 3x \rightarrow$  is a linear equation, so it's a straight line.  
 $\rightarrow$  y intercept is  $(0,0)$  & slope is  $\frac{3}{1}$

$y = 3^x$  is an exponential equation (curve) yint is  $(0,1)$  & common ratio is 3.



54. Write the equations of the two lines that the shape could be reflected over and have the image map directly onto itself.

Equation 1:  $x = 4$

Equation 2:  $x$  axis or  $y = 0$

