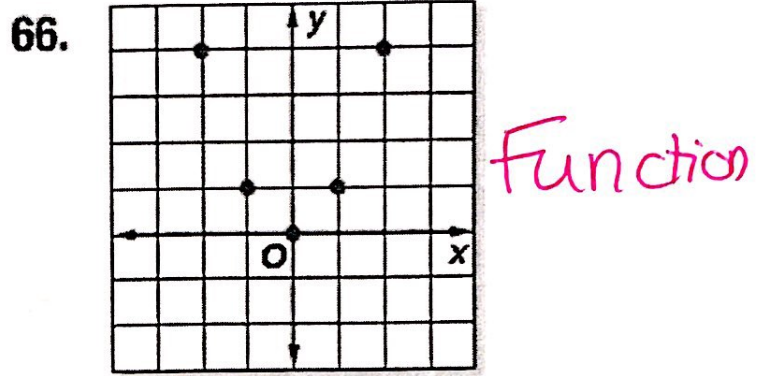
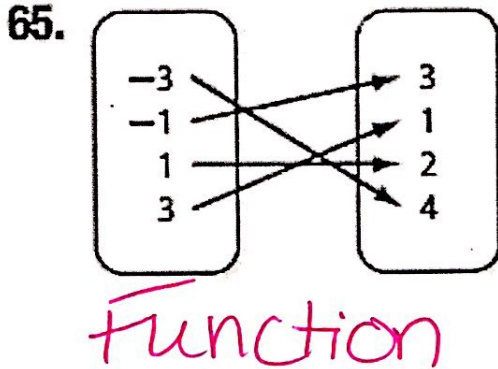


Section 1.7

Determine whether each relation is a function.



67. $\{(8, 4), (6, 3), (4, 2), (2, 1), (6, 0)\}$ *NOT A FUNCTION*

If $f(x) = 2x + 4$ and $g(x) = x^2 - 3$, find each value.

68. $f(-3)$ *-2* 69. $g(2)$ *1* 70. $f(0)$ *4*

71. $g(-4)$ *13* 72. $f(m+2)$ *$2m+8$* 73. $g(3p)$ *$9p^2-3$*

74. GRADES A teacher claims that the relationship between number of hours studied for a test and test score can be described by $g(x) = 45 + 9x$, where x represents the number of hours studied. Graph this function.

If $f(x) = 3x - 2$ find each value:

75. $4[f(2)]$

$4[f(2)] = 4[3(2) - 2]$

$4[f(2)] = 4[6 - 2]$

$4[f(2)] = 4[4]$

$4[f(2)] = 16$

76. $1.5[f(-1)]$

$1.5[f(-1)] = 1.5[3(-1) - 2]$

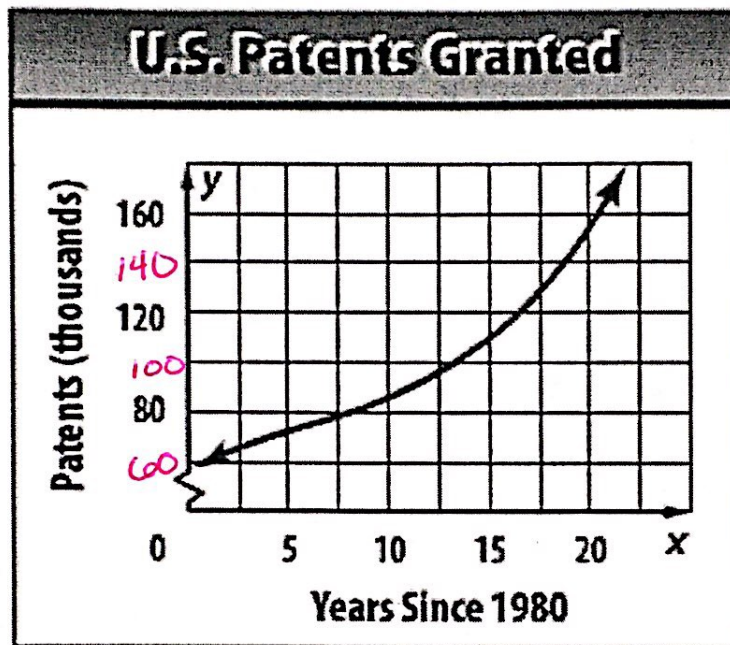
$1.5[-3 - 2]$

$1.5[-5]$

-7.5

Section 1.8

75. Identify the function graphed as *linear* or *nonlinear*. Then estimate and interpret the intercepts of the graph, any symmetry, where the function is positive, negative, increasing, and decreasing, the x -coordinate of any relative extrema, and the end behavior of the graph.



End behaviors

Before 1980 there were less patents granted, as time goes on patents are granted at a higher amount.

- Nonlinear
- y -int $(0, 60)$ In 1980 there were 60 patents granted
- No x -int.
- No symm.
- Positive $0 \leq x$ OR $0 \leq x < \infty$
- never negative
- ~~Increasing~~ Increasing $0 \leq x$ OR $0 \leq x < \infty$
- never decreasing

Section 3.1

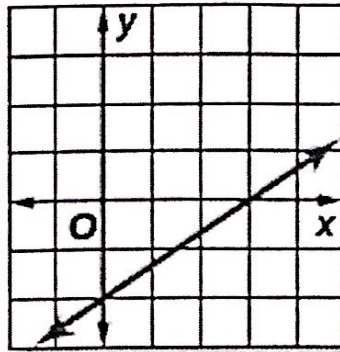
Find the x-intercept and y-intercept of the graph of each linear function.

11.

x	y
-8	0
-4	3
0	6
4	9
8	12

x-int (-8, 0)
y-int (0, 6)

12.



x-int (3, 0)
y-int (0, -2)

Graph each equation.

For 13 and 14 graph using the x- and y-intercepts. For 15 and 16 graph using a table (4 inputs minimum)

x-int (2, 0)
y-int (0, 2)

13. $y = -x + 2$

14. $x + 5y = 4$

x-int (4, 0)
y-int (0, 4/5)

15. $2x - 3y = 6$

16. $5x + 2y = 10$

17. **SOUND** The distance d in kilometers that sound waves travel through water is given by $d = 1.6t$, where t is the time in seconds.

x	y
-1	+7.5
0	5
1	2.5
2	0

a. Make a table of values and graph the equation.

b. Use the graph to estimate how far sound can travel through water in 7 seconds.

Table

x	y
-1	$-2\frac{2}{3}$
0	-2
1	$-1\frac{1}{3}$
2	$-2\frac{2}{3}$

a)

x	y
0	0
1	1.6
2	3.2
3	4.8

*negatives do not make sense here.

b) $d = 1.6(7)$
 $d = 11.2$
Kilometers

Section 3.2

Find the root of each equation. Solve Algebraically.

x-int!

**y has to equal zero*

18. $0 = 2x + 8$ *-4* 19. $0 = 4x - 24$ *6*

20. $3x - 5 = 0$ *$\frac{5}{3}$ or $1\frac{2}{3}$* 21. $6x + 3 = 0$ *$-\frac{1}{2}$*

x-int! Solve each equation by graphing. Create a table - 4 points minimum.

22. $0 = 16 - 8x$ *2* *solution on graph* 23. $0 = 21 + 3x$ *-7*

24. $-4x - 28 = 0$ *-7* 25. $25x - 225 = 0$ *9*

26. **FUNDRAISING** Sean's class is selling boxes of popcorn to raise money for a class trip. Sean's class paid \$85 for the popcorn, and they are selling each box for \$1. The function $y = x - 85$ represents their profit y for each box of popcorn sold x . Find the zero and describe what it means in this situation.

Zero = 85

Once they have sold 85 boxes of popcorn they will have earned back their initial investment.

27) Solve for the root algebraically: *they will break even after selling 85 boxes.*

a) $3x + 4 = 5x$
-5x -5x

$-2x + 4 = 0$

*$-\cancel{2}x = -4$
 $\frac{-\cancel{2}x}{-\cancel{2}} = \frac{-4}{-\cancel{2}}$*

$x = 2$

b) $7x + 2 = 9 + 7x$
-7x -7x

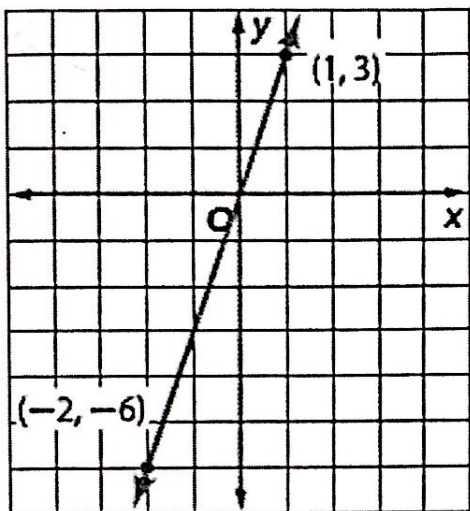
$2 = 9$

NO SOLUTION

Section 3.3

Find the rate of change represented in each table or graph.

27.



$m=3$

28.

x	y
-2	-3
0	-3
4	-3
12	-3

$m=0$

Find the slope of the line that passes through each pair of points.

29. $(0, 5), (6, 2)$ $m = -\frac{1}{2}$

30. $(-6, 4), (-6, -2)$ *undefined*

31. PHOTOS The average cost of online photos decreased from \$0.50 per print to \$0.15 per print between 2002 and 2009. Find the average rate of change in the cost.

Explain what it means. *An average decrease in cost of \$0.05 per year.*

-0.05

Solve for the missing term:

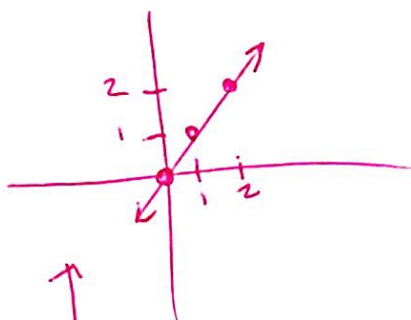
32) A line passes through $(2, 3)$ and $(r, 7)$ and has a slope of 2. Find r.

$\frac{y_2 - y_1}{x_2 - x_1} = m$

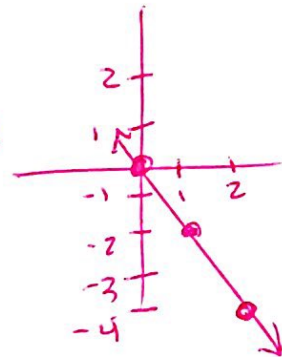
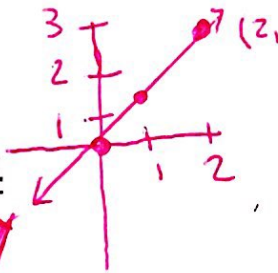
$\frac{7-3}{r-2} = 2 \rightarrow \frac{4}{r-2} = 2 \rightarrow 4 = 2(r-2) \rightarrow 4 = 2r - 4 \rightarrow 8 = 2r \rightarrow \frac{8}{2} = \frac{2r}{2} \rightarrow r = 4$

33) A line passes through $(1, x)$ and $(3, -2)$ and has a slope of .5. Find x

$.5 = \frac{-2-x}{3-1} \rightarrow .5 = \frac{-2-x}{2} \rightarrow 1 = -2-x \rightarrow +2 \quad +2 \rightarrow 3 = -x \rightarrow x = -3$



Section 3.4



Graph each equation.

32. $y = x$

33. $y = \frac{4}{3}x$

34. $y = -2x$

Suppose y varies directly as x . Write a direct variation equation that relates x and y . Then solve.

35. If $y = 15$ when $x = 2$, find y when $x = 8$.

$15 = m \cdot 2$
 $m = 7.5$

$y = 7.5x$
 $y = 7.5(8)$
 $y = 60$

36. If $y = -6$ when $x = 9$, find x when $y = -3$.

$y = -\frac{2}{3}x$ $x = 4.5$

37. If $y = 4$ when $x = -4$, find y when $x = 7$.

$y = -x$ OR $y = -x$ $y = -7$

38. JOBS Suppose you earn \$127 for working 20 hours.

a. Write a direct variation equation relating your earnings to the number of hours worked.

$y = 6.35x$

b. How much would you earn for working 35 hours?

\$ 222.25

Section 3.5

Find the next three terms of each arithmetic sequence.

39. 6, 11, 16, 21, ...

26, 31, 36

40. 1.4, 1.2, 1.0, ...

0.8, 0.6, 0.4

Write an equation for the n th term of each arithmetic sequence.

41. $a_1 = 6, d = 5$ $a_n = 5n + 1$

42. 28, 25, 22, 19, ... $a_n = -3n + 31$

43. SCIENCE The table shows the distance traveled by sound in water. Write an equation for this sequence. Then find the time for sound to travel 72,300 feet.

Time (s)	1	2	3	4
Distance (ft)	4820	9640	14,460	19,280

$a_n = 4820n$

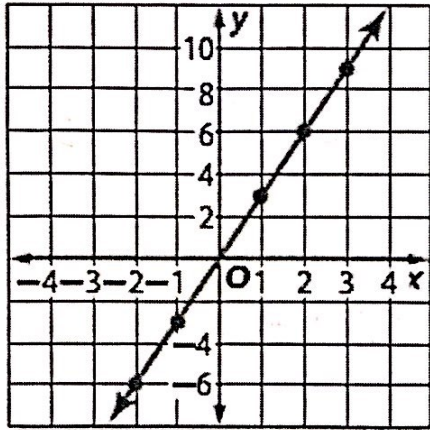
15 seconds

$$\begin{array}{r} 72300 = 4820n \\ \underline{4820} \quad \underline{4820} \end{array}$$

$15 = n$

Section 3.6

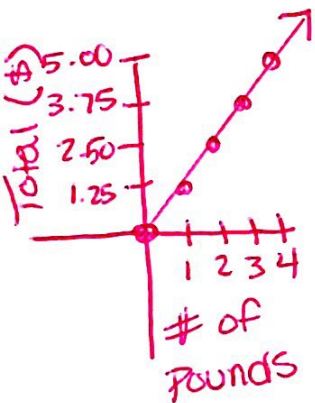
44. Write an equation in function notation for this relation.



$$f(x) = 3x$$

45. ANALYZE TABLES The table shows the cost of picking your own strawberries at a farm.

Number of Pounds	1	2	3	4
Total Cost (\$)	1.25	2.50	3.75	5.00



- Graph the data.
- Write an equation in function notation to describe this relationship. $f(x) = 1.25x$
- How much would it cost to pick 6 pounds of strawberries? $\$7.50$

46) Is the graph from number 45 part a proportional? Explain your reasoning.

Yes, because it is linear and crosses the origin.