

Name: \_\_\_\_\_  
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Algebra 1 Chapter 3 Study Guide

1. Determine whether each equation is a linear equation if so write the equation in standard form.

a.  $y = 4 - 3x$

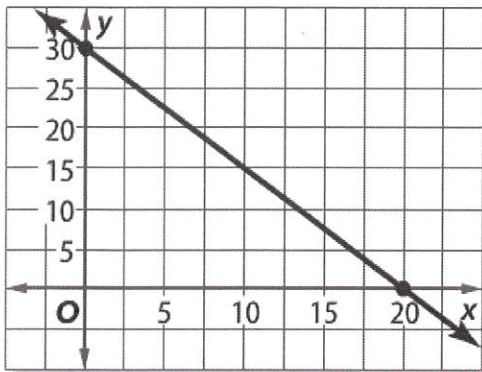
Linear  
 $y = 4 - 3x$   
 $+3x \quad +3x$   
 $3x + y = 4$

b.  $6x - xy = 4$

Not Linear

$Ax + By = C$

2. Find the x- and y-intercept of the line.



x-intercept  $(20, 0)$

y-intercept  $(0, 30)$

3. The table shows the function relating the distance to an amusement <sup>park</sup> in miles and the time in hours the Brown family has driven. Find the x- and y-intercepts and describe what they mean in this situation.

Time (h)	Distance (mi)
0	248
1	186
2	124
3	62
4	0

zeros  
 $(0, 248)$  ← y-intercept  
 $(4, 0)$  ← x-intercept  
 At the start (or zero hrs) the Brown family has 248 miles to go.  
 After 4 hours they have zero miles to go.

4. Graph  $-x+2y=6$  by using the x- and y-intercepts

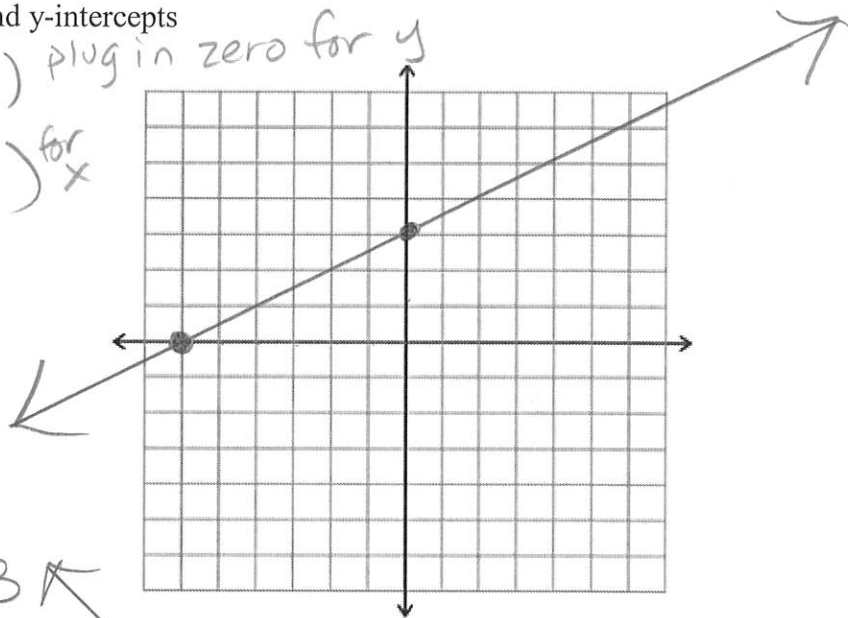
x-intercept  $(-6, 0)$  plug in zero for y  
 y-intercept  $(0, 3)$  for x

$$-x + 2(0) = 6$$

$$\frac{-x}{-1} = \frac{6}{-1} \quad x = -6$$

$$-0 + 2y = 6$$

$$\frac{2y}{2} = \frac{6}{2} \quad y = 3$$



5. Graph  $y = -x + 2$  by making a table.

x	y
0	2
1	1
2	0
3	-1

$$y = -0 + 2$$

$$y = 2$$

$$y = -1 + 2$$

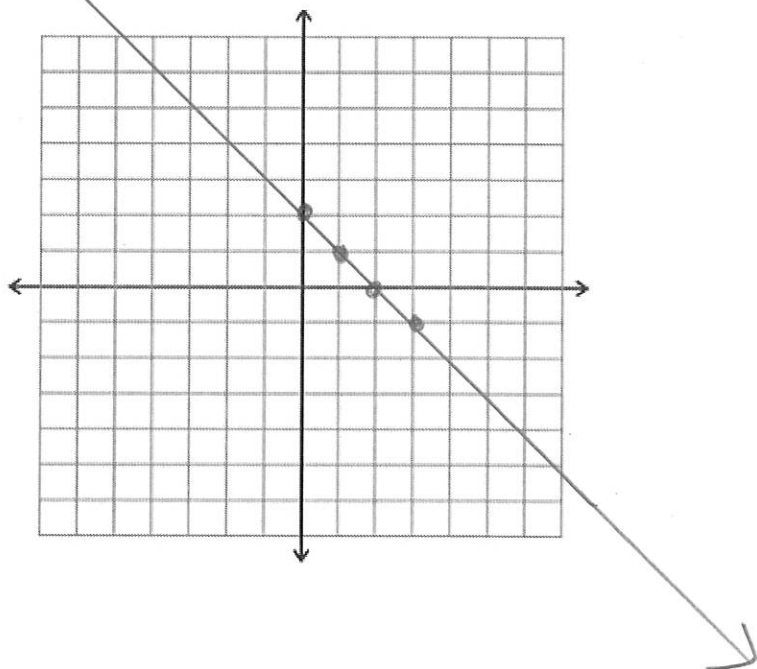
$$y = 1$$

$$y = -2 + 2$$

$$y = 0$$

$$y = -3 + 2$$

$$y = -1$$



6. Solve each equation

a.  $3x + 1 = -2$

$$\frac{-1 \quad -1}{-1 \quad -1}$$

$$\frac{3x = -3}{3 \quad 3}$$

$$x = -1$$

b.  $-1.25x + 3 = 0$

$$\frac{-3 \quad -3}{-3 \quad -3}$$

$$\frac{-1.25x = -3}{-1.25 \quad -1.25}$$

$$x = 2.4$$

7. Solve the equation  $2 - 3x = 6 - 3x$

$$\frac{2 - 3x + 3x}{+3x + 3x}$$

$$2 = 6$$



Not  
True

Side Note

$$-1 = -1$$

True

$\infty$  sol.

8. Emily is going to a local carnival. The function  $m = 20 - 0.75r$  represents the amount of money  $m$  she has left after  $r$  rides. Find the zero of this function and describe what this value means in this context.

Find when  $m = 0$

$$0 = 20 - 0.75r$$

$$\frac{-20 \quad -20}{-0.75 \quad -0.75} = \frac{-0.75r}{-0.75}$$

$$26.\bar{6} = r$$

When she has zero dollars she went on  $26.\bar{6}$  rides.

9. The table shows how a tiled surface area changes with the number of floor tiles. Find the rate of change and explain what it means.

$$\text{rate of change} = \frac{\Delta y}{\Delta x}$$

$$\frac{48}{3} \approx 16$$

Number of Floor Tiles	Area of Tiled Surface (in <sup>2</sup> )
x	y
3	48
6	96
9	144

+3    <    >    +48  
+3    <    >    +48

For every 1 floor tile the surface go up by  $16 \text{ in}^2$

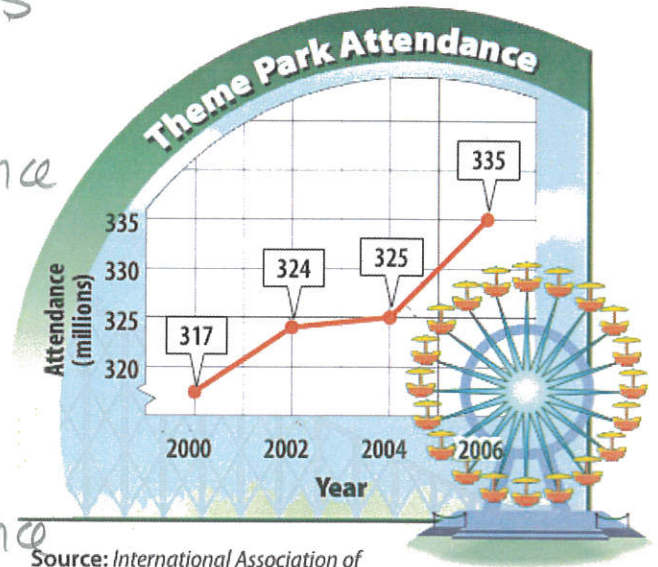
10. The graph shows the number of people who visited U.S. theme parks in recent years. Find the rates of change for 2000-2002 and 2002-2004 and explain the meaning of each rate of change.

$$\frac{\Delta y}{\Delta x} = \frac{324 - 317}{2002 - 2000} = \frac{7}{2} = 3.5$$

For every year the Attendance increases by 3.5 million

$$\frac{\Delta y}{\Delta x} = \frac{325 - 324}{2004 - 2002} = \frac{1}{2} = 0.5$$

For every year the Attendance increases by 0.5 million



Source: International Association of Amusement Parks and Attractions

11. Determine whether each function is linear. Explain.

a.

x	y
-3	11
-2	15
-1	19
1	23
2	27

Handwritten annotations:  $\Delta x$  values are -1, +1, +2, +1.  $\Delta y$  values are +4, +4, +4, +4.

Not Linear

$\frac{\Delta y}{\Delta x}$  is not Constant

b.

x	y
12	-4
9	1
6	6
3	11
0	16

Handwritten annotations:  $\Delta x$  values are -3, -3, -3, -3.  $\Delta y$  values are +5, +5, +5, +5.

yes Linear

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



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

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

a.  $(-3, 4)$  and  $(2, -3)$

$$m = \frac{-3 - 4}{2 - (-3)} = \frac{-7}{5}$$

$$m = \frac{-7}{5}$$

b.  $(-3, -1)$  and  $(2, -1)$

$$m = \frac{-1 - (-1)}{2 - (-3)} = \frac{-1 + 1}{2 + 3} = \frac{0}{5}$$

$$m = 0$$

\* Recall zero on top  $m = 0$   
zero on bottom  $m = \text{und}$

13. Find the value of  $r$  so the line that passes through each pair of points has the given slope.

a.  $(-2, 6), (r, -4); m = -5$

$$-5 = \frac{-4 - 6}{r - (-2)}$$

$$(r+2) \cdot -5 = \frac{-10}{r+2} (r+2)$$

$$\begin{array}{r} -5r - 10 = -10 \\ +10 \quad +10 \\ \hline -5r = 0 \end{array}$$

$$\frac{-5r}{-5} = \frac{0}{-5}$$

$$r = 0$$

b.  $(r, -6), (5, -8); m = -8$

$$-8 = \frac{-8 - (-6)}{5 - r}$$

$$-8 = \frac{-8 + 6}{5 - r}$$

$$(5-r) \cdot -8 = \frac{-2}{5-r} (5-r)$$

$$\begin{array}{r} -40 + 8r = -2 \\ +40 \quad +40 \\ \hline 8r = 38 \end{array}$$

$$\frac{8r}{8} = \frac{38}{8}$$

$$r = 4.75$$

14. Suppose  $y$  varies directly as  $x$  and  $y = 72$  when  $x = 8$ . Find  $x$  when  $y = 63$ .

$$y = kx$$

$$\frac{72}{8} = \frac{k \cdot 8}{8} \quad y = 9x$$

$$9 = k$$

$$\frac{63}{9} = \frac{9 \cdot x}{9}$$

$$x = 7$$

15. The distance a jet travels varies directly as the number of hours it flies. Write the direct variation equation for a jet that traveled 3420 miles in 6 hours and estimate how many hours it will take for the jet to fly 6500 miles.

$$y = 6500 \quad y = kx$$

$$\frac{3420}{6} = \frac{k \cdot 6}{6}$$

$$570 = k$$

$$y = 570x$$

$$\frac{6500}{570} = \frac{570x}{570}$$

$$x = 11.40350877 \text{ hr}$$

It will take about 11.4 hrs to travel 6500 miles

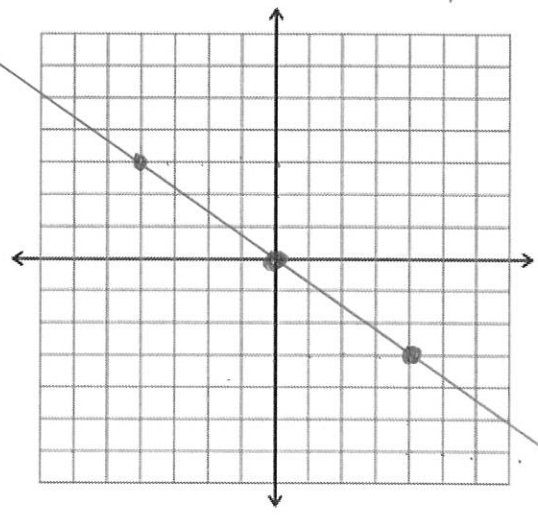
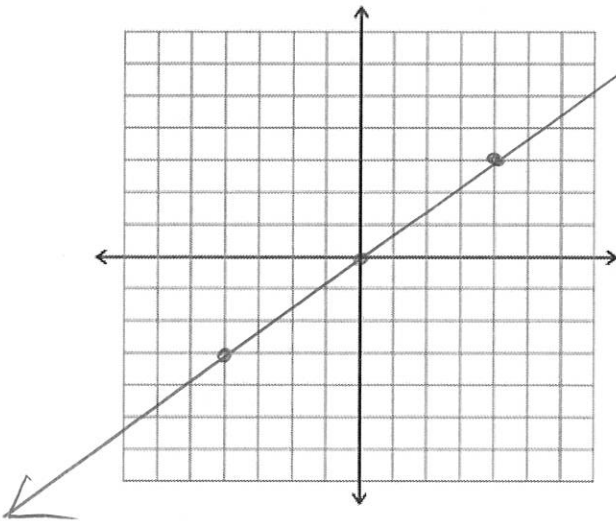
16. Graph each equation.

a.  $y = \frac{2}{3}x$

$m = \frac{3}{4}$  up 3 right 4

b.  $y = -\frac{3}{4}x$

$m = -\frac{3}{4}$  down 3 right 4



17. Determine whether each sequence is an arithmetic sequence. Explain.

a. -26, -22, -18, -14, ...

✓ ✓ ✓  
+4 +4 +4

yes  $d = 4$

b. 1, 4, 9, 25, ...

✓ ✓ ✓  
+3 +5 +14

No no common difference

18. Find the next three terms of the arithmetic sequence 9.5, 11.0, 12.5, 14.0, ...

✓ ✓ ✓  
+1.5 +1.5 +1.5

15.5, 17, 18.5

19. Consider the arithmetic sequence 3, -10, -23, -36, ...

a. Write an equation for the  $n$ th term of the sequence

$a_n = 3 + (n-1) \cdot (-13)$

$a_n = 3 - 13n + 13$

$a_n = 16 - 13n$

b. Find the 15th term

$n = 15$   $a_{15} = 16 - 13(15)$

$a_{15} = -179$

c. Which term of the sequence is -114.

$-114 = 16 - 13n$   
 $-14 - 14$

$\frac{-130}{-13} = \frac{-13n}{-13}$

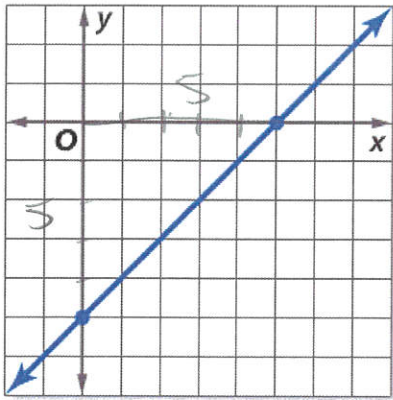
$n = 10$

Common difference

1st term

20. Write an equation in function notation for each relation.

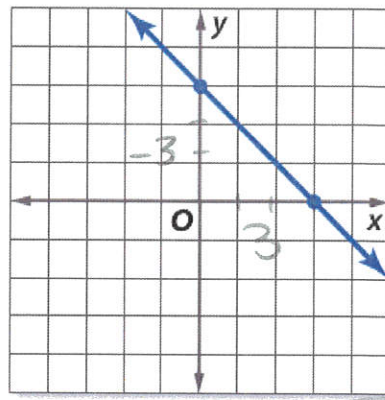
a.



$m = \frac{5}{5}$   
 $m = 1$

$y = 1x$

b.



$m = \frac{-3}{3}$   
 $m = -1$

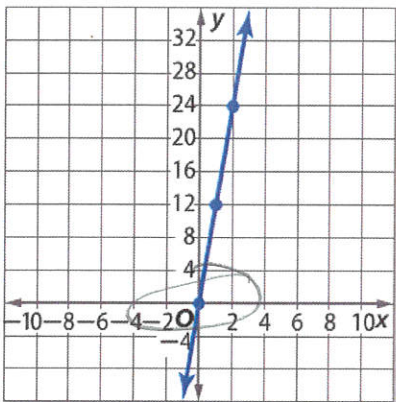
$y = -1x$

↳ goes through (0,0)

21. Determine whether each function is proportional or non-proportional.

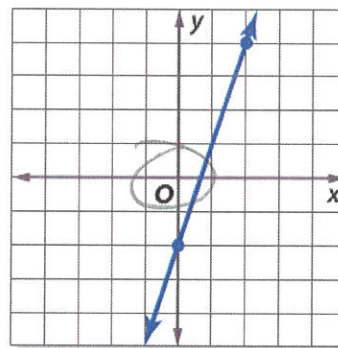
! Does not go through (0,0)

a.



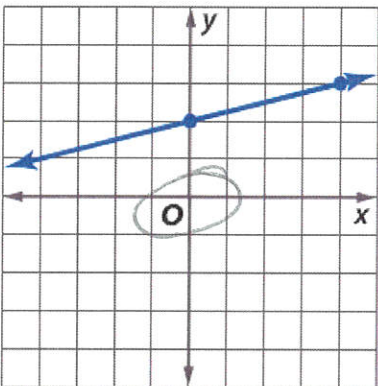
yes

c.



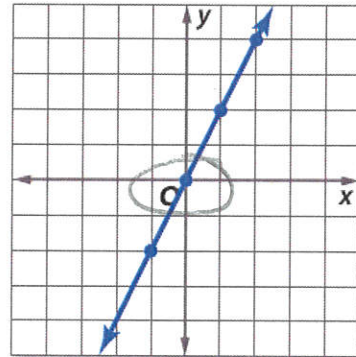
No

b.



No

d.

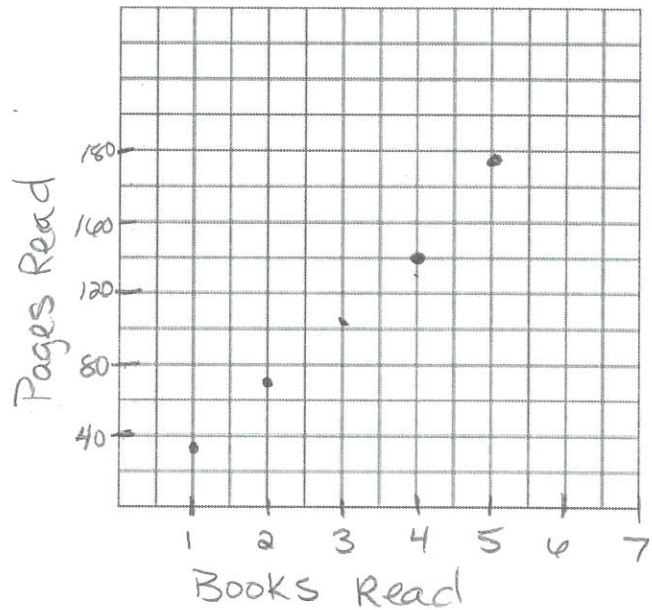


yes

22. The table shows the pages of comic books read.

		+1	+1	+1	+1	
x	<b>Books Read</b>	1	2	3	4	5
y	<b>Pages Read</b>	35	70	105	140	175
		+35	+35	+35	+35	

a. Graph the data.



b. Write an equation to describe the relationship.

$$m = \frac{\Delta y}{\Delta x} = \frac{35}{1} = 35$$

$$y = 35x$$

c. Find the number of pages read if 8 comic books were read.

Find  $y$  when  $x = 8$

$$y = 35(8)$$

$$y = 280 \text{ pages}$$

If 8 comic books were read  
then 280 pages were read