

Key

Chapter 2 Test Review

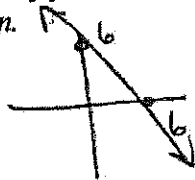
2A

1. Find the domain and range of the relation and determine if it is a function.

$\{(-2, 2), (0, -4), (0, 3), (1, 2), (2, 3)\}$

$D: \{-2, 0, 1, 2\}$  not a function  
 $R: \{-4, 2, 3\}$  x value of zero repeats!

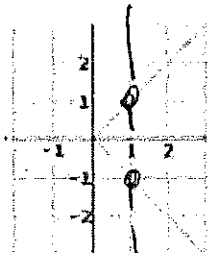
2. Graph the relation represented by  $y = -x + 6$  and determine the domain and range. Determine whether the equation is a function.



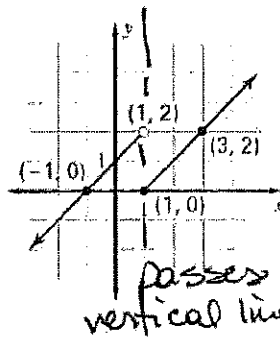
$D: \mathbb{R}$   
 $R: \mathbb{R}$

Yes - It is a function!  
 passes vertical line test

3. Determine if the given relation is a function.



no  
 fails  
 vertical  
 line  
 test



Yes!  
 open circle  
 @ (1, 2) says  
 not continuous  
 at that point

State whether each function is linear and explain why or why not.

a)  $2x + xy - 3y = 0$

no! x & y  
 are multiplied  
 together

b)  $f(x) = 4 - x^3$

no!  
 exponent  
 other than 1

c)  $f(x) = \frac{4}{x+1}$

no!  
 variable  
 in denominator

d)  $6y - x = 7$

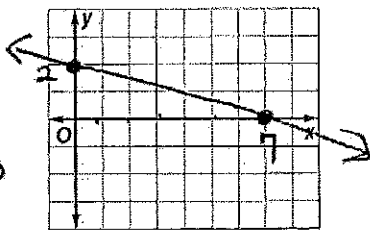
yes!  
 • no exponents  
 • no variables  
 mult. together  
 • no  $\sqrt{\quad}$  or abs. value  
 symbols  
 • no variable in  
 denominator

2B

Graph each line using intercepts

5.  $7y = -2x + 14$

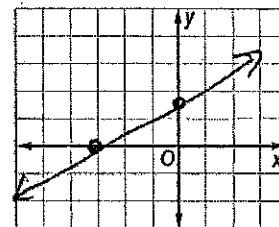
$7(0) = -2x + 14$   
 $0 = -2x + 14$   
 $-14 = -2x$   
 $\frac{-14}{-2} = \frac{-2x}{-2}$   
 $x = 7 \Rightarrow (7, 0)$   
 $7y = -2(0) + 14$   
 $7y = 14$   
 $y = 2 \Rightarrow (0, 2)$



6.  $2.5x - 5y + 7.5 = 0$

$2.5x - 5y = -7.5$

$2.5x - 5(0) = -7.5$   
 $2.5x = -7.5$   
 $x = -3$   
 $(-3, 0)$   
 $2.5(0) - 5y = -7.5$   
 $-5y = -7.5$   
 $y = 1.5$   
 $(0, 1.5)$



Write each equation in standard form and identify A, B, & C.

7.  $\left[ \frac{1}{3}y = \frac{2}{3}x + 5 \right]$

$y = 2x + 5$   
 $(-1) \left[ -2x + y = 5 \right]$   
 $\left[ 2x - y = -5 \right]$

8.  $18y = 24x - 9$

$-24x - 24x$   
 $(-1) \left( -24x + 18y = -9 \right)$   
 $\left[ 24x - 18y = 9 \right]$

2C

Find the given value if:  $g(x) = \frac{3x^2 - x^3}{x^2 + 3x}$

9.  $g(-2) = \frac{3(-2)^2 - (-2)^3}{(-2)^2 + 3(-2)}$

$= \frac{3(4) - (-8)}{4 - 6} = \frac{12 + 8}{-2} = \frac{20}{-2} = -10$

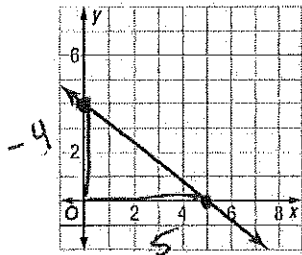
10.  $g(2) = \frac{3(2)^2 - (2)^3}{(2)^2 + 3(2)}$

$= \frac{3(4) - 8}{4 + 6} = \frac{12 - 8}{10} = \frac{4}{10} = \frac{2}{5}$

2D

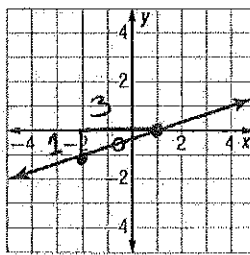
Find the slope of each graphed line.

11.



$m = -\frac{4}{5}$

12.



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

Find the slope from the given points.

13.  $(5, -3)$  and  $(-4, 3)$   
 $x_1, y_1 \quad x_2, y_2$

$\frac{3 - (-3)}{-4 - 5} = \frac{6}{-9} = -\frac{2}{3}$

14.  $(6, 4)$  and  $(3, 4)$

$\frac{4 - 4}{3 - 6} = \frac{0}{-3} = 0$

15.  $(5, -5)$  and  $(5, 5)$

$\frac{5 - (-5)}{5 - 5} = \frac{10}{0} = \text{undefined}$

Identify the slope of each line.

16.  $y - 5 = 0$   
 $+5 \quad +5$

$y = 5$   
 horizontal line  
 slope = 0

17.  $x = -3$ ,  
 vertical line  
 slope = undefined

Find the rate of change and explain its meaning.

18.

Time P.M.	People in Auditorium
7:15	26
7:22	61
7:24	71
7:30	101
7:40	151

2E

Write an equation in slope-intercept form for the line described.

19. slope  $-2$ , and passing through  $(-4, 6)$

$$m = -2$$

$$(-4, 6)$$

$$x_1, y_1$$

$$y - y_1 = m(x - x_1)$$

$$y - 6 = -2(x - (-4))$$

$$y - 6 = -2(x + 4)$$

$$y - 6 = -2x - 8$$

$$+6 \quad +6$$

$$y = -2x - 2$$

20. passing through the points:  $(4, 1)$  and  $(2, -3)$

$$m = \frac{-3 - 1}{2 - 4} = \frac{-4}{-2} = 2$$

$$(4, 1)$$

$$x_1, y_1$$

$$y - y_1 = m(x - x_1)$$

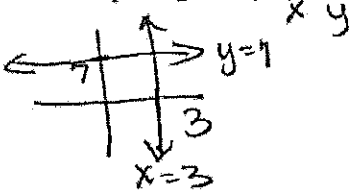
$$y - 1 = 2(x - 4)$$

$$y - 1 = 2x - 8$$

$$+1 \quad +1$$

$$y = 2x - 7$$

21. passing through  $(3, -4)$  and perpendicular to the line  $y = 7$ . Name one additional point on the new line.



all vertical lines perpendicular to horizontal lines.

$$x = 3$$

22. passing through  $(-2, 1)$  and perpendicular to  $y = 4x + 11$

$$m = 4$$

$$\perp m = -1/4$$

$$y - 1 = -1/4(x - (-2))$$

$$y - 1 = -1/4(x + 2)$$

$$y - 1 = -1/4x - 1/2$$

$$+1 \quad +1$$

$$y = -1/4x + 1/2$$

23. Write the equation in slope intercept form for the line that is passing through  $(6, 1)$  and is parallel to the line with the equation  $5x - 3y = -15$ .

$$-3y = -5x - 15$$

$$\frac{-3y}{-3} = \frac{-5x}{-3} - \frac{15}{-3}$$

$$y = 5/3x + 5$$

$$m = 5/3$$

parallel = same slope!

$$y - 1 = 5/3(x - 6)$$

$$y - 1 = 5/3x - 10$$

$$+1 \quad +1$$

$$y = 5/3x - 9$$

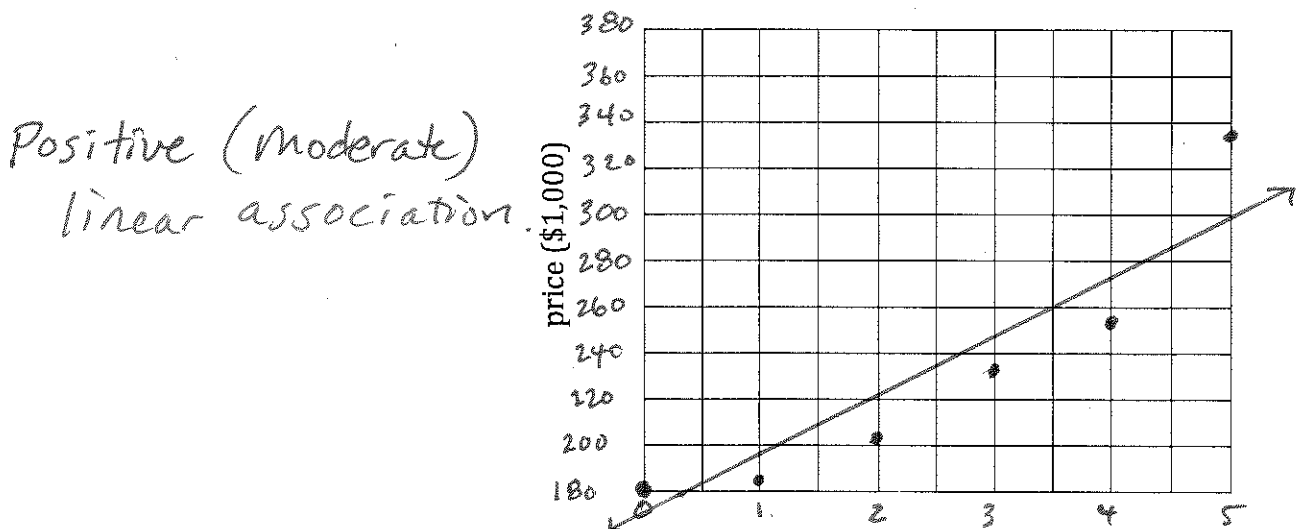
2F

24. The housing market in Austin is making it harder for people who work here, to live here. First time home buyers are getting pushed out of the housing market. The following table shows the median home price in the Austin area in March for the last 6 years.

year	2010 yr 0	2011 yr 1	2012 yr 2	2013 yr 3	2014 yr 4	2015 yr 5
Housing (1,000)	180	185	205	235	255	338

- a. Make a scatter plot and a line of best fit.  
Describe the correlation.

Median Home Price in Austin



- Use calculator to find the best fit "regression" equation.  
b. Choose two specific points to write a prediction equation.

$$y = 29.43x + 159.4$$

- c. Use your prediction equation predict the selling price for a home in the year 2018.

$$\$394,860$$

- d. Do you think this is a good prediction equation and a reasonable answer? Will the equation hold true 10 years from now?

So-so. Because  $r = .933$  (which is <sup>only fairly</sup> close to 1).

The equation will probably not hold true for 10 years from now. Extrapolation.