CHAPTER 2

Chapter Review

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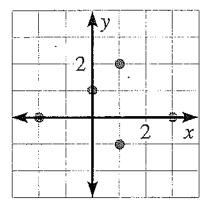
2.1 FUNCTIONS AND THEIR GRAPHS

Examples on pp. 67–70

EXAMPLE You can represent a relation with a table of values or a graph of ordered pairs.

x	0	1	−2	3	1
y	1	−1	0	0	2



This relation is not a function because $x = 1$ is paired with both $y = -1$ and $y = 2$.

Graph the relation. Then tell whether the relation is a function.

1.

x	−1	0	1	2	3
y	10	7	4	1	−2

2.

x	6	1	0	4	3	5
y	2	4	2	1	5	0

2.2 SLOPE AND RATE OF CHANGE

Examples on pp. 75–78

EXAMPLE You can find the slope of a line passing through two given points.

Points: (5, 0) and (−3, 4) **Slope:** $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 0}{-3 - 5} = \frac{4}{-8} = -\frac{1}{2}$

Find the slope of the line passing through the given points.

3. (3, 6), (−6, 0) **4.** (2, 4), (−2, 4) **5.** (−7, 2), (−1, −4) **6.** (5, 1), (5, 4)

2.3 QUICK GRAPHS OF LINEAR EQUATIONS

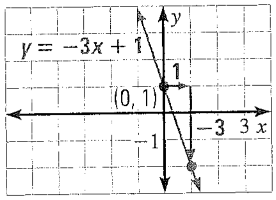
Examples on pp. 82–85

EXAMPLES You can graph a linear equation in slope-intercept or in standard form.

$y = -3x + 1$

slope $= -3$

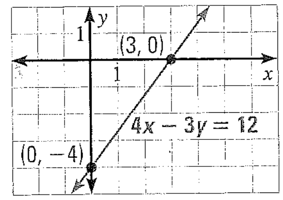
y-intercept $= 1$



$4x - 3y = 12$

x-intercept $= 3$

y-intercept $= -4$



Graph the equation.

7. $y = -x + 3$ **8.** $y = \frac{1}{2}x - 7$ **9.** $4x + y = 2$ **10.** $-4x + 8y = -16$

2.4 WRITING EQUATIONS OF LINES

Examples on pp. 91–94

EXAMPLES You can write an equation of a line using (**a**) the slope and y-intercept, (**b**) the slope and a point on the line, or (**c**) two points on the line.

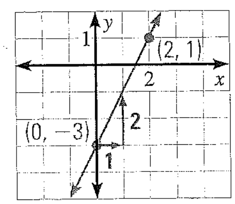
a. Slope-intercept form, $m = 2$ and $b = -3$: $y = 2x - 3$

b. Point-slope form, $m = 2$ and $(x_1, y_1) = (2, 1)$: $y - 1 = 2(x - 2)$

$y = 2x - 3$

c. Points $(0, -3)$ and $(2, 1)$: slope $= \frac{1 - (-3)}{2 - 0} = 2$

Use either slope-intercept form or point-slope form: $y = 2x - 3$



Write an equation of the line that has the given properties.

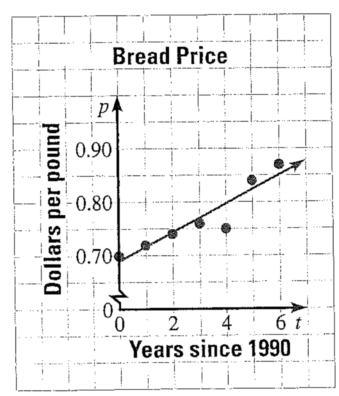
11. slope: -1, y-intercept: 2 **12.** slope: 3, point: $(-4, 1)$ **13.** points: $(3, -8)$, $(8, 2)$

2.5 CORRELATION AND BEST-FITTING LINES

Examples on pp. 100–102

EXAMPLE You can graph paired data to see what relationship, if any, exists. The table shows the price p (in dollars per pound) of bread where t is the number of years since 1990.

t	0	1	2	3	4	5	6
p	0.70	0.72	0.74	0.76	0.75	0.84	0.87



Approximate the best-fitting line using (4, 0.80) and (6, 0.85),

$m = \frac{0.85 - 0.80}{6 - 4} = 0.025$ $y - 0.80 = 0.025(x - 4)$

$y = 0.025x + 0.70$

2.5 continued

Approximate the best-fitting line for the data.

14.

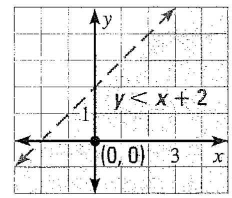
x	14	11	21	3	4	19	10	1	17	6
y	4	6	1	10	9	0	5	10	2	7

2.6 LINEAR INEQUALITIES IN TWO VARIABLES

Examples on pp. 108–110

EXAMPLE You can graph a linear inequality in two variables in a coordinate plane.

To graph $y < x + 2$, first graph the boundary line $y = x + 2$. Use a dashed line since the symbol is $<$, not $\leq$. Test the point $(0, 0)$. Since $(0, 0)$ *is* a solution of the inequality, shade the half-plane that contains it.



Graph the inequality in a coordinate plane.

15. $2x < 6$ **16.** $y \leq 7$ **17.** $y \geq -x + 4$ **18.** $x + 8y > 8$

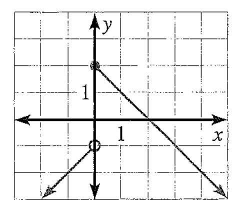
2.7 PIECEWISE FUNCTIONS

Examples on pp. 114–116

EXAMPLE You can graph a piecewise function by graphing each piece separately.

$$y = \begin{cases} x - 1, & \text{if } x < 0 \\ -x + 2, & \text{if } x \geq 0 \end{cases}$$

Graph $y = x - 1$ to the left of $x = 0$.
Graph $y = -x + 2$ to the right of and including $x = 0$.



Graph the function.

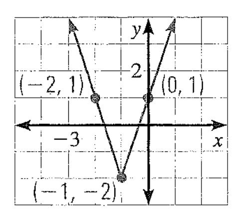
19. $y = \begin{cases} 2x, & \text{if } x < -1 \\ 2x + 1, & \text{if } x \geq -1 \end{cases}$ **20.** $y = \begin{cases} -x, & \text{if } x \leq 0 \\ 3x, & \text{if } x > 0 \end{cases}$ **21.** $y = \begin{cases} -2, & \text{if } x \leq 2 \\ 2, & \text{if } x > 2 \end{cases}$

2.8 ABSOLUTE VALUE FUNCTIONS

Examples on pp. 122–124

EXAMPLE You can graph an absolute value function using symmetry.

The graph of $y = 3|x + 1| - 2$ has vertex $(-1, -2)$. Plot a second point such as $(0, 1)$. Use symmetry to plot a third point, $(-2, 1)$. Note that $a = 3 > 0$ and $|a| > 1$, so the graph opens up and is narrower than the graph of $y = |x|$.



Graph the function.

22. $y = -|x| + 1$ **23.** $y = |x - 4| + 3$ **24.** $y = 2|x| - 5$ **25.** $y = 3|x + 6| - 2$