

Chapter 2

Resource Masters

MathMatters 3



New York, New York Columbus, Ohio Woodland Hills, California Peoria, Illinois

CONSUMABLE WORKBOOKS Many of the worksheets contained in the Chapter Resource Masters booklets are available as consumable workbooks.

Reteaching Workbook
Extra Practice Workbook

0-07-869309-8
0-07-869306-3

ANSWERS FOR WORKBOOKS The answers for Chapter 2 of these workbooks can be found in the back of this Chapter Resource Masters booklet.

StudentWorks™ This CD-ROM includes the entire Student Edition along with the English workbooks listed above.

TeacherWorks™ All of the materials found in this booklet are included for viewing and printing in the *MathMatters 3 TeacherWorks* CD-ROM.



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MathMatters 3
Chapter 2 Resource Masters

1 2 3 4 5 6 7 8 9 10 047 13 12 11 10 09 08 07 06 05 04

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A Teacher's Guide to Using the Chapter 2 Resource Masters

The *Fast File* Chapter Resource system allows you to conveniently file the resources you use most often. The *Chapter 2 Resource Masters* include the core materials needed for Chapter 2. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing in the *MathMatters 3 TeacherWorks* CD-ROM.

Vocabulary Builder Pages vii-ix include a student study tool that presents the key vocabulary terms from the chapter. Students are to record definitions and/or examples for each term. You may suggest that students highlight or star the terms with which they are not familiar.

When to Use Give these pages to students before beginning Lesson 2-1. Remind them to add definitions and examples as they complete each lesson.

Reteaching There is one Reteaching master for each lesson.

When to Use Use these masters as reteaching activities for students who need additional reinforcement. These pages can also be used in conjunction with the Student Edition as an instructional tool for those students who have been absent.

Extra Practice There is one master for each lesson. These provide computational practice at a basic level.

When to Use These worksheets can be used with students who have weaker mathematics backgrounds or need additional reinforcement.

Enrichment There is one master for each lesson. These activities may extend the concepts in the lesson, offer a historical or multicultural look at the concepts, or widen students' perspectives on the mathematics they are learning. These are not written exclusively for honors students, but are accessible for use with all levels of students.

When to Use These may be used as extra credit, short-term projects, or as activities for days when class periods are shortened.

Assessment Options

The assessment section of the *Chapter 2 Resources Masters* offers a range of assessment tools for final assessment. The following lists describe each assessment master and its intended use.

Chapter Assessments

Chapter Tests

- *Forms A and B* are composed of free-response questions aimed at the average-level student. These tests are similar in format to offer comparable testing situations.

Continuing Assessment

- The **Standardized Test Practice** offers continuing review of concepts in multiple choice format. The extended response section includes performance assessment tasks that are suitable for all students. Sample answers are provided for assessment.

Answers

- Page A1 is an answer sheet for the Standardized Test Practice questions that appear in the Student Edition on pages 98 and 99. This improves students' familiarity with the answer formats they may encounter in test taking.
- The answers for the lesson-by-lesson masters are provided as reduced pages with answers appearing in red.
- Full-size answer keys are provided for the assessment options in this booklet.

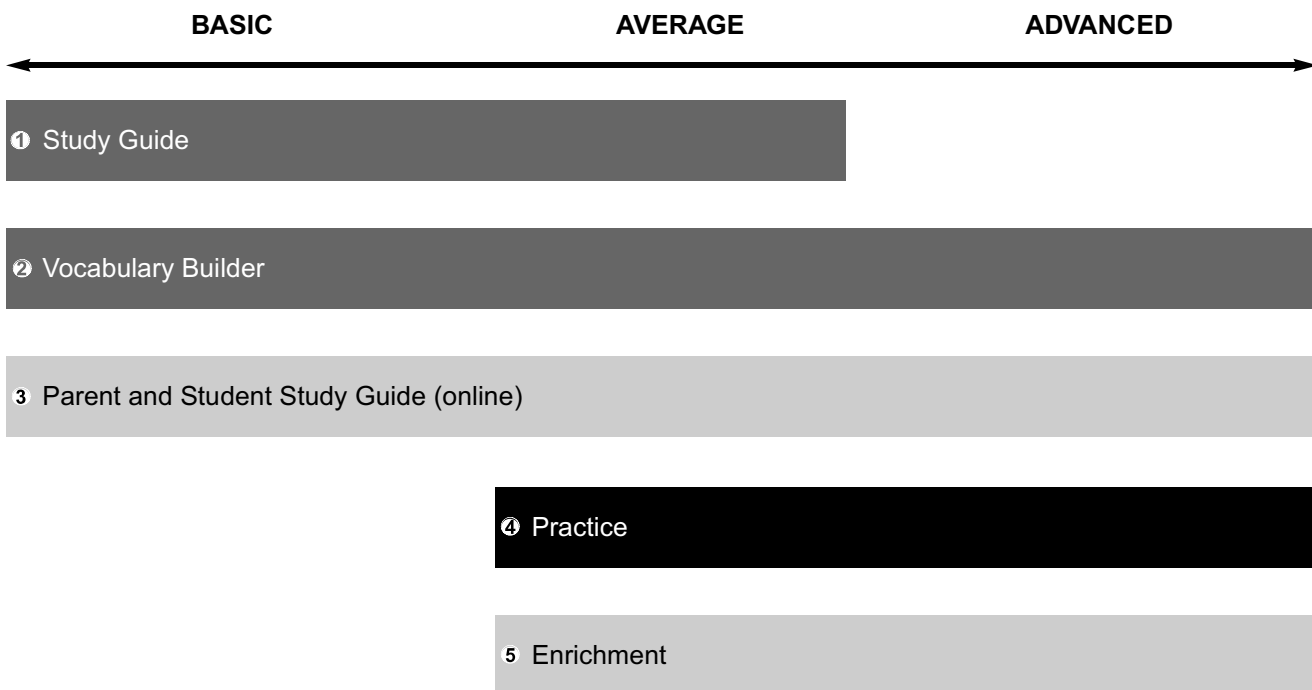
Chapter 2 Leveled Worksheets

Glencoe’s **leveled worksheets** are helpful for meeting the needs of every student in a variety of ways. These worksheets, many of which are found in the **FAST FILE Chapter Resource Masters**, are shown in the chart below.

- **Reteaching** masters provide worked-out examples as well as practice problems.
- Each chapter’s **Vocabulary Builder** master provides students the opportunity to write out key concepts and definitions in their own words.
- **Extra Practice** masters provide average-level problems for students who are moving at a regular pace.
- **Enrichment** masters offer students the opportunity to extend their learning.

Five Different Options to Meet the Needs of Every Student in a Variety of Ways

primarily skills
primarily concepts
primarily applications



Reading to Learn Mathematics

Vocabulary Builder

This is an alphabetical list of the key vocabulary terms you will learn in Chapter 2. As you study the chapter, complete each term's definition or description. Remember to add the page number where you found the term.

Vocabulary Term	Found on Page	Definition/Description/Example
absolute value function		
boundary		
closed half-plane		
cluster		
constant		
coordinate		
coordinate plane		
data		
dependent variable		
domain		
equivalent equation ih•KWIHV•luhnt		
frequency table		
function		
gap		

(continued on the next page)

Reading to Learn Mathematics*Vocabulary Builder (continued)*

Vocabulary Term	Found on Page	Definition/Description/Example
half-plane		
histogram		
independent variable		
inverse operations		
iteration		
like terms		
linear equations LIHN•ee•uhr		
linear functions		
linear inequality		
mapping		
mean		
measures of central tendency		
median		
mode		
open half-plane		
ordered pair		
origin AWR•uh•juhn		

(continued on the next page)

Reading to Learn Mathematics*Vocabulary Builder* (continued)

Vocabulary Term	Found on Page	Definition/Description/Example
outlier OWT•LY•uhr		
pattern		
population		
quadrant KWAH•druhnt		
range		
relation		
sample		
sequence SEE•kwuhn(t)s		
similar terms		
statistics		
stem-and-leaf plot		
term		
vertical line test		
<i>x</i> -axis		
<i>y</i> -axis		

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RETEACHING 2-1

PATTERNS AND ITERATIONS

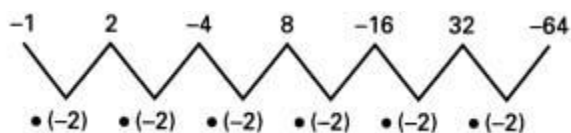
You can determine the number pattern in a sequence by finding the relationship between the numbers, or terms. This relationship is the rule that describes the number sequence. A process that is repeated over and over is an iteration.

Example 1

Identify the pattern $-1, 2, -4, 8 \dots$ and find the next three terms.

Solution

In this pattern, each number equals -2 times the number to the left.



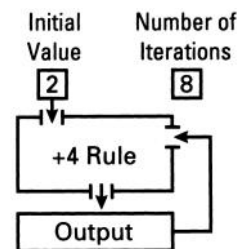
The next three terms are $-16, 32,$ and -64 .

Example 2

Complete the iteration diagram for the sequence $2, 6, 10, 14 \dots$. Calculate the output for 8 iterations.

Solution

Study the pattern of the sequence to determine the rule. Enter the initial value, the number of iterations, and the rule. Then calculate the output. The output is $6, 10, 14, 18, 22, 26, 30, 34$.



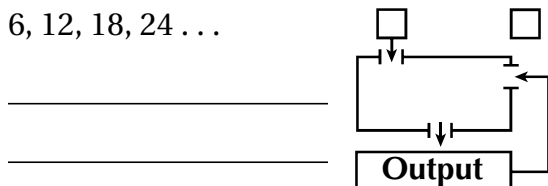
EXERCISES

Find the next three terms in each sequence.

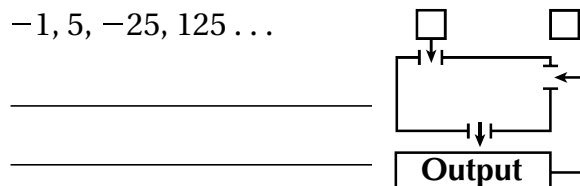
- 1. $0, -3, -6, -9$ _____
- 2. $7, 14, 21, 28$ _____
- 3. $100, 10, 1, 0.1$ _____
- 4. $4, 8, 16, 32$ _____
- 5. $\frac{1}{3}, -\frac{2}{3}, \frac{4}{3}, -\frac{8}{3}$ _____
- 6. $-16, 4, -1, \frac{1}{4}$ _____
- 7. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ _____
- 8. $1, 8, 27, 64$ _____

Complete the iteration diagram for the sequence. Calculate the output for the first six iterations.

- 9. $6, 12, 18, 24 \dots$



- 10. $-1, 5, -25, 125 \dots$



EXTRA PRACTICE **2-1****PATTERNS AND ITERATION****▣ EXERCISES**

Identify the rule relating each term. Find the next three terms in each sequence.

1. 4, 6, 8, 10, _____, _____, _____ rule: _____
2. 1, 3, 7, 13, 21, _____, _____, _____ rule: _____
3. 200, 190, 180, 170, _____, _____, _____ rule: _____
4. -16, -13, -10, -7, _____, _____, _____ rule: _____
5. 4, 8, 16, 32, _____, _____, _____ rule: _____
6. 9, 6, 3, 0, _____, _____, _____ rule: _____
7. 8, -24, 72, -216, _____, _____, _____ rule: _____
8. 15, 14, 12, 9, _____, _____, _____ rule: _____
9. 4, 2, 1, $\frac{1}{2}$, _____, _____, _____ rule: _____
10. 2, 1.5, 1, 0.5, _____, _____, _____ rule: _____
11. 6, 0, -6, -12, _____, _____, _____ rule: _____
12. -4, 16, -64, 256, _____, _____, _____ rule: _____
13. 4, -1, $\frac{1}{4}$, $-\frac{1}{16}$, _____, _____, _____ rule: _____
14. 6, 12, 18, 24, _____, _____, _____ rule: _____
15. 8, -4, 2, -1, _____, _____, _____ rule: _____
16. Start with 4. Use the rule “subtract 2” six times. _____
17. Start with 100. Use the rule “add 25” six times.

18. Start with 30. Use the rule “multiply by -2” six times.

19. Start with 500. Use the rule “divide by 5” six times. _____

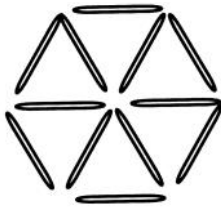
ENRICHMENT 2-1

TOOTHPICK PUZZLES

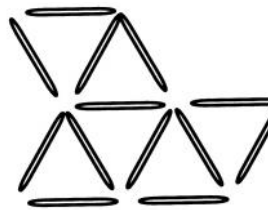
EXERCISES

The puzzles on this page involve only a box of toothpicks.

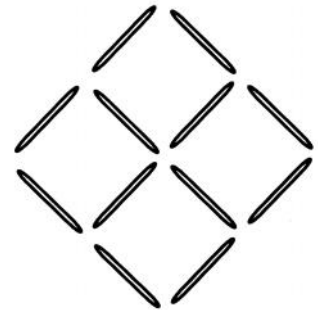
1. Move 4 toothpicks to make 3 equilateral triangles.



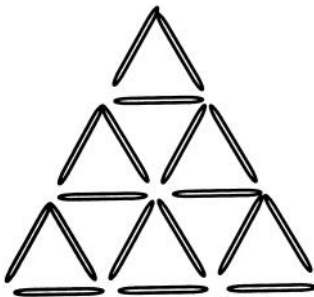
2. Remove 3 toothpicks to make 3 equilateral triangles.



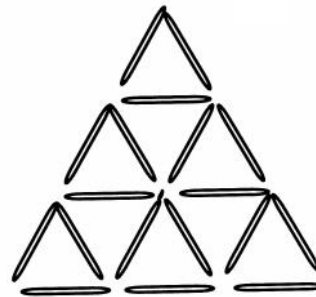
3. Move 4 toothpicks to make 3 identical squares.



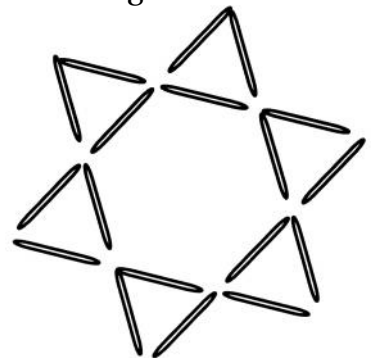
4. Remove 5 toothpicks to make 5 congruent triangles.



5. Move 6 toothpicks to make a six-pointed star.



6. Move 2 toothpicks to make 6 equilateral triangles.



Use toothpicks to make a 3-by-3 square divided into 9 smaller squares. Then solve each of these puzzles. Sketch your answers below.

7. Remove 4 toothpicks to make 5 identical squares.

8. Remove 8 toothpicks to make 3 squares.

9. Remove 6 toothpicks to make 3 squares.

In each puzzle, make a true equation by moving just one toothpick.

10. $\times - | = |$

11. $| - ||| = ||$

RETEACHING 2-2**THE COORDINATE PLANE, RELATIONS, AND FUNCTIONS**

A set of ordered pairs is a **relation**. The **domain** of a relation is the set of all possible x -coordinates. The **range** of a relation is the set of all possible y -coordinates. A set of ordered pairs in which each element of the domain is paired with exactly one element in the range is a **function**.

Example 1

Determine whether each relation is a function. State each domain and range.

- a. $9 \rightarrow -9$
 $8 \rightarrow -8$
 $7 \rightarrow -7$
- b. $\{(2, 1), (3, 1), (4, 1)\}$

Solution

- a. No, the element 7 in the domain is paired with two elements in the range, -9 and -7 . Domain: $\{7, 8, 9\}$
 Range: $\{-9, -8, -7\}$
- b. Yes, each element of the domain is paired with only one element of the range. Domain: $\{2, 3, 4\}$
 Range: $\{1\}$

Example 2

Evaluate each function.

- a. $f(x) = 4x + 5; f(2)$
 b. $g(x) = 6x + 1; g(-4)$

Solution

- a. $f(2) = 4(2) + 5$
 $= 8 + 5$
 $= 13$
- b. $g(-4) = 6(-4) + 1$
 $= -24 + 1$
 $= -23$

EXERCISES

Determine whether each relation is a function. Give the domain and range of each.

1. $0 \rightarrow -4$ Function: _____
 $1 \rightarrow 2$ Domain: _____
 $-1 \rightarrow -2$ Range: _____
2. $6 \rightarrow 1$ Function: _____
 $0 \rightarrow 0$ Domain: _____
 $-1 \rightarrow -1$ Range: _____
 $-2 \rightarrow -2$

3. $\{(0, 2), (1, 4), (5, 1)\}$ Function: _____
 Domain: _____
 Range: _____
4. $\{(2, 1), (6, 2), (1, 6)\}$ Function: _____
 Domain: _____
 Range: _____
5. $\{(4, 7), (7, 4), (4, 4)\}$ Function: _____
 Domain: _____
 Range: _____

Given $f(x) = -2x + 3$, evaluate each function.

6. $f(0)$ _____ 7. $f(8)$ _____ 8. $f(-1)$ _____ 9. $f(100)$ _____

Given $f(x) = (3x + 4) - (2 - x)$, evaluate each function.

10. $f(0)$ _____ 11. $f(5)$ _____ 12. $f(-\frac{1}{2})$ _____ 13. $f(-3)$ _____

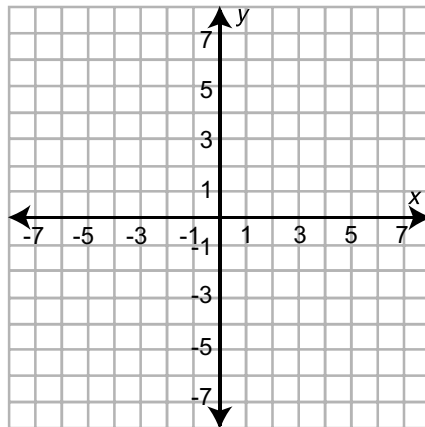
EXTRA PRACTICE 2-2

THE COORDINATE PLANE, RELATIONS, AND FUNCTIONS

EXERCISES

Graph each point on the coordinate plane at the right.

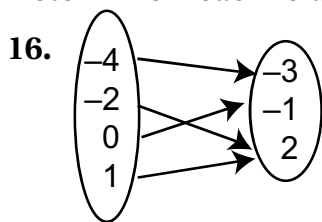
- 1. $A(2, 4)$ 2. $B(-3, 5)$ 3. $C(6, 0)$
- 4. $D(0, -3)$ 5. $E(7, -6)$ 6. $F(1, -1)$
- 7. $G(-2, 3)$ 8. $H(-6, -5)$ 9. $I(-3, -4)$



Give $f(x) = 3x - 2$, evaluate each function.

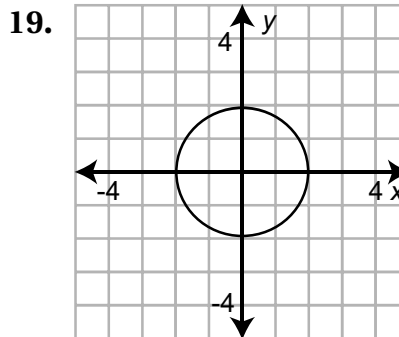
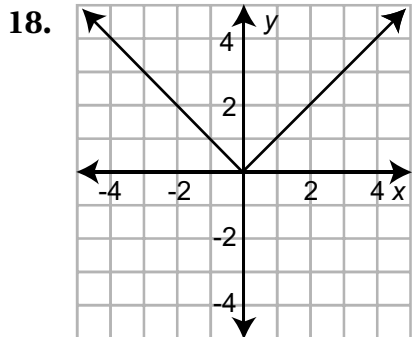
- 10. $f(-1)$ _____ 11. $f(3)$ _____ 12. $f(0)$ _____
- 13. $f(-3)$ _____ 14. $f\left(\frac{1}{3}\right)$ _____ 15. $f(5)$ _____

Determine if each relation is a function. Give the domain and range.



17.

x	-1	4	3	3
y	3	5	4	-2

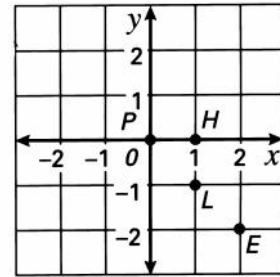


Given $f(x) = -x + 4$, $g(x) = 5x - 3$, and $h(x) = 2x^2$, find each value.

- 20. $f(4)$ _____ 21. $g(2)$ _____
- 22. $h(-1)$ _____ 23. $f(-3)$ _____

ENRICHMENT 2-2
SECRET CODE

A coordinate graph can be used to make a secret code. Letter labels on the points show the order of the letters in the message. For example, if $(1, 0) = H$, $(2, -2) = E$, $(1, -1) = L$, and $(0, 0) = P$, the grid at the right would show the word "HELP."



EXERCISES

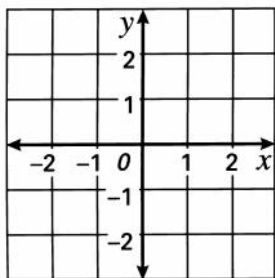
Choose a different pair of coordinates for each letter of the alphabet below. Use values from -2 through 2 for both x and y . Then graph points to show each secret message.

A	B	C	D	E	F	G

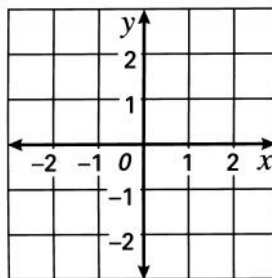
H	I	J	K	L	M	N	O	P

R	S	T	U	V	W	X	Y	Z

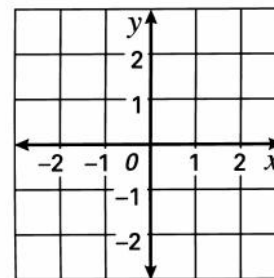
1. SUCCESS



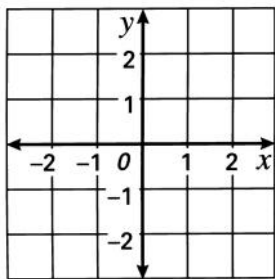
2. MEET AT TWO



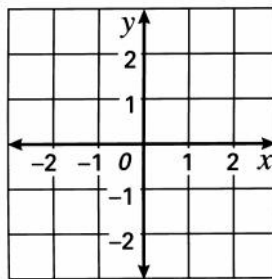
3. NEED A CAR



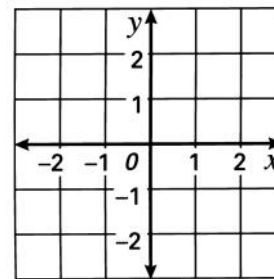
4. SEND MONEY



5. THANK YOU



6. BRING FOOD



RETEACHING 2-3**LINEAR FUNCTIONS**

The graph of a linear equation is a straight line.

The absolute value function is defined as $g(x) = |x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0. \end{cases}$

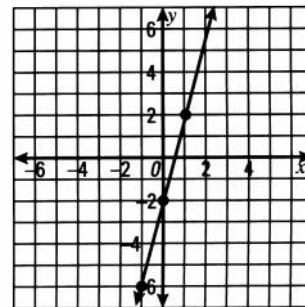
Example 1

Graph $y = 4x - 2$.

Solution

Choose at least three values for x values for y . Make a table to show the ordered pairs. Then plot the points and draw the graph.

x	$4x - 2$	y	Ordered Pair
-1	$4(-1) - 2$	-6	$(-1, -6)$
0	$4(0) - 2$	-2	$(0, -2)$
1	$4(1) - 2$	2	$(1, 2)$

**Example 2**

Evaluate $h(x) = |2x - 1|$ for the given value of x .

a. $h(0)$

b. $h(2)$

c. $h(-2)$

Solution

$$\begin{aligned} \text{a. } h(0) &= |2(0) - 1| \\ &= |-1| \\ &= 1, \text{ since } -1 < 0 \end{aligned}$$

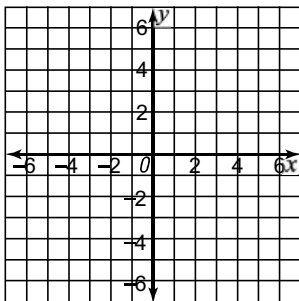
$$\begin{aligned} \text{b. } h(2) &= |2(2) - 1| \\ &= |3| \\ &= 3, \text{ since } 3 \geq 0 \end{aligned}$$

$$\begin{aligned} \text{c. } h(-2) &= |2(-2) - 1| \\ &= |-5| \\ &= 5, \text{ since } -5 < 0 \end{aligned}$$

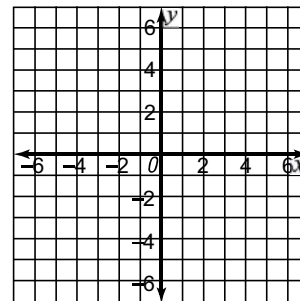
EXERCISES

Graph each function.

1. $y = x$



2. $y = 2x - 3$



Evaluate $h(x) = |-x + 6|$ for the graph value of x .

3. $h(0)$ _____

4. $h(-2)$ _____

5. $h(5)$ _____

6. $h(-10)$ _____

Evaluate $g(x) = |x - 5|$ for the given value of x .

7. $g(-5)$ _____

8. $g(6)$ _____

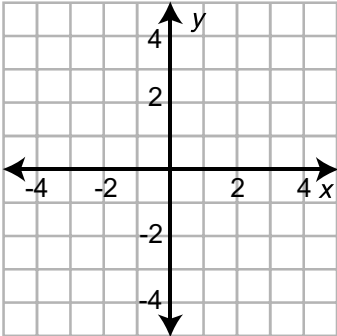
9. $g(-9)$ _____

10. $g(15)$ _____

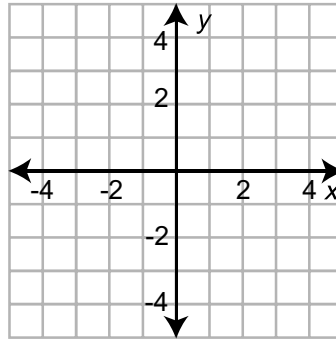
EXTRA PRACTICE **2-3****LINEAR FUNCTIONS****EXERCISES**

Graph each function.

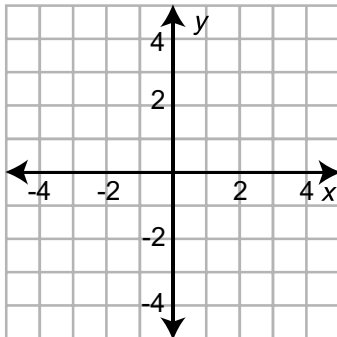
1. $y = x + 2$



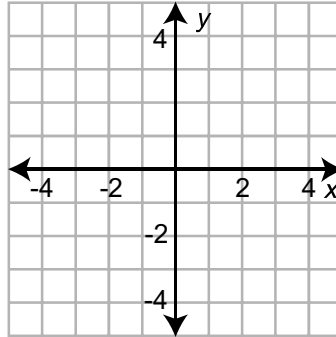
2. $y = -3x$



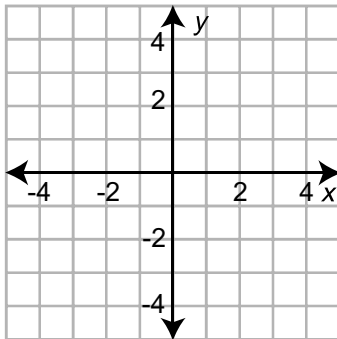
3. $y - 2 = -x + 1$



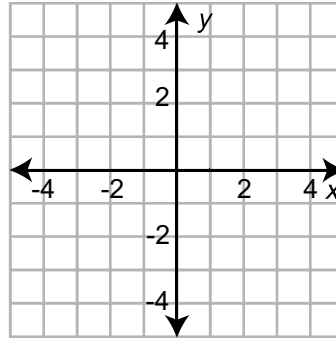
4. $2y = -4x + 2$



5. $y = |x - 1|$



6. $y = \begin{cases} 2 & \text{for } x < -2 \\ -x - 1 & \text{for } x \geq -2 \end{cases}$

Evaluate $f(x) = |-2x - 1|$ for the given value of x .

7. $f(-2)$ _____

8. $f(0)$ _____

9. $f(1)$ _____

10. $f(-4)$ _____

ENRICHMENT 2-3

THE STEP FUNCTION

The symbol $[x]$ is used to stand for the greatest integer that is less than or equal to a given real number x . For example, $[4.3] = 4$ because 4 is the greatest integer less than or equal to 4.3. The greatest integer function can be written as $G(x) = [x]$.

EXERCISES

Find $[x]$ for each value of x .

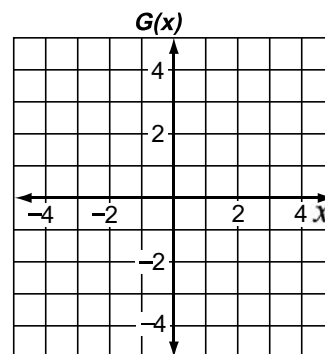
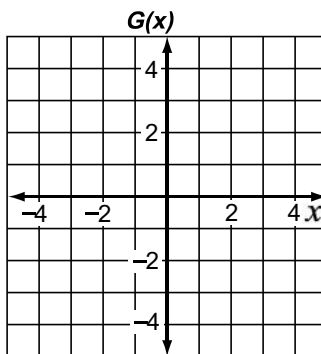
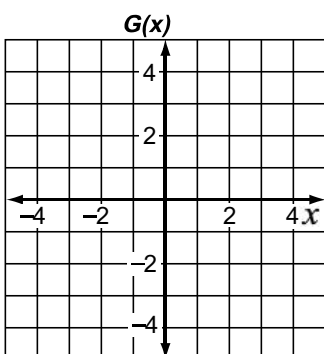
1. $[6.2]$ _____ 2. $[6]$ _____ 3. $[-6.2]$ _____ 4. $[-6]$ _____
 5. $[0.2]$ _____ 6. $[-0.2]$ _____ 7. $[0]$ _____ 8. $[\pi]$ _____

Graph each function.

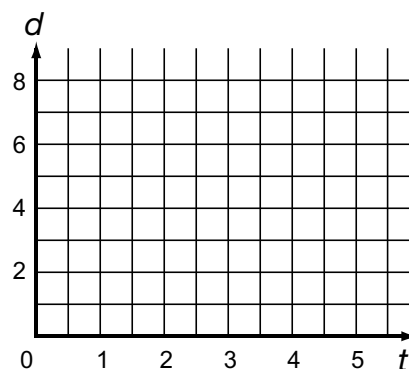
9. $G(x) = [x]$

10. $G(x) = [x] + 1$

11. $G(x) = [x + 1]$



12. The cost of a telephone dial-in weather service is \$2.50 for the first minute (or less), and \$1.00 for each additional minute (or part of a minute). Draw a graph of this function on the grid at the right. Use t for the time in minutes and d for the cost in dollars.



13. Why is the greatest integer function sometimes called the “step function”?

RETEACHING 2-4**SOLVE ONE-STEP EQUATIONS**

For all real numbers, a , b , and c , if $a = b$ then:

$$a + c = b + c \text{ and } c + a = c + b \quad \leftarrow \text{ Addition Property of Equality}$$

$$ac = bc \text{ and } ca = cb \quad \leftarrow \text{ Multiplication Property of Equality}$$

Example 1

Solve each equation. Use Algeblocks to model each step if you wish.

a. $p + 7 - 15 = 9 + 15$

b. $\frac{1}{3}d = 5(60)$

Solution

a. $p + 7 - 15 = 9 + 15$ **Represent equation.**

b. $\frac{1}{3}d = 5(60)$ **Represent equation.**

$$p - 8 = 24 \quad \text{Simplify.}$$

$$3\left(\frac{1}{3}\right)d = 300(3) \quad \text{Multiply each side by 3.}$$

$$p - 8 + 8 = 24 + 8 \quad \text{Add 8 to each side.}$$

$$d = 900$$

$$p = 32$$

Example 2

Translate each sentence into an equation using n to represent the unknown number. Then solve the equation of n .

a. One tenth of 40 is the same as the sum of -3 and some number.

b. Increasing a number by 43 yields the same result as multiplying 6 by 12.

Solution

a. The equation is $\frac{1}{10}(40) = -3 + n$.
Solve. $4 = -3 + n$
 $7 = n$

b. The equation is $n + 43 = 6(12)$.
Solve. $n + 43 = 72$
 $n = 29$

EXERCISES

Solve each equation. Use Algeblocks to model each step if you wish.

1. $-12 + a = 32$ _____

2. $12 - b = 16$ _____

3. $-5 = c + 9$ _____

4. $2d = 16$ _____

5. $\frac{m}{9} = -5$ _____

6. $-\frac{1}{3}f = 24$ _____

7. $g + \frac{1}{2} = 2$ _____

8. $\frac{h}{7} = 9 + 5$ _____

9. $-(-8)(5) = 2j$ _____

Translate each sentence into an equation using n to represent the unknown number. Then solve the equation for n .

10. A number subtracted from 46 is -21 . _____

11. The quotient of a number divided by 11 is 0.5. _____

EXTRA PRACTICE **2-4****SOLVE ONE-STEP EQUATIONS****▣ EXERCISES**

Solve each equation.

1. $n + 13 = 24$ _____

2. $35 - b = 19$ _____

3. $5r = -45$ _____

4. $-12 = q - 3$ _____

5. $15j = 30$ _____

6. $0.4h = 1.6$ _____

7. $14 = \left(-\frac{7}{8}\right)x$ _____

8. $\left(\frac{5}{9}\right)d = 20$ _____

9. $6.32 = t - 4.16$ _____

10. $\frac{3}{4} = f + \frac{1}{2}$ _____

Translate each sentence into an equation using n to represent the unknown number. Then solve the equation for n .

11. When a number is decreased by 13, the result is -2 . _____

12. Twelve more than a number is the product of -3 and 6. _____

13. One-fourth of a number is the same as the square of -3 . _____

14. Sixteen is the same as the quotient of a number and 12. _____

15. Increasing a number by 14 yields the same result as taking one-half of 40.

16. The quotient of a number and -2 is the same as the sum of -4 and 10.

Solve each equation.

17. $(-1)(-4)(5) = 20d$ _____

18. $|14 - 22| = 4y$ _____

19. $2^2 + v = 3^2$ _____

20. $(1.5)(10) = f - 13 + 7$ _____

21. $15 + 4 - s = (-3)(-2)$ _____

22. $0.02g = (0.5)(4.2)$ _____

Find all solutions in each equation.

23. $|x| + 4 = 12$ _____

24. $-16 = -2|q|$ _____

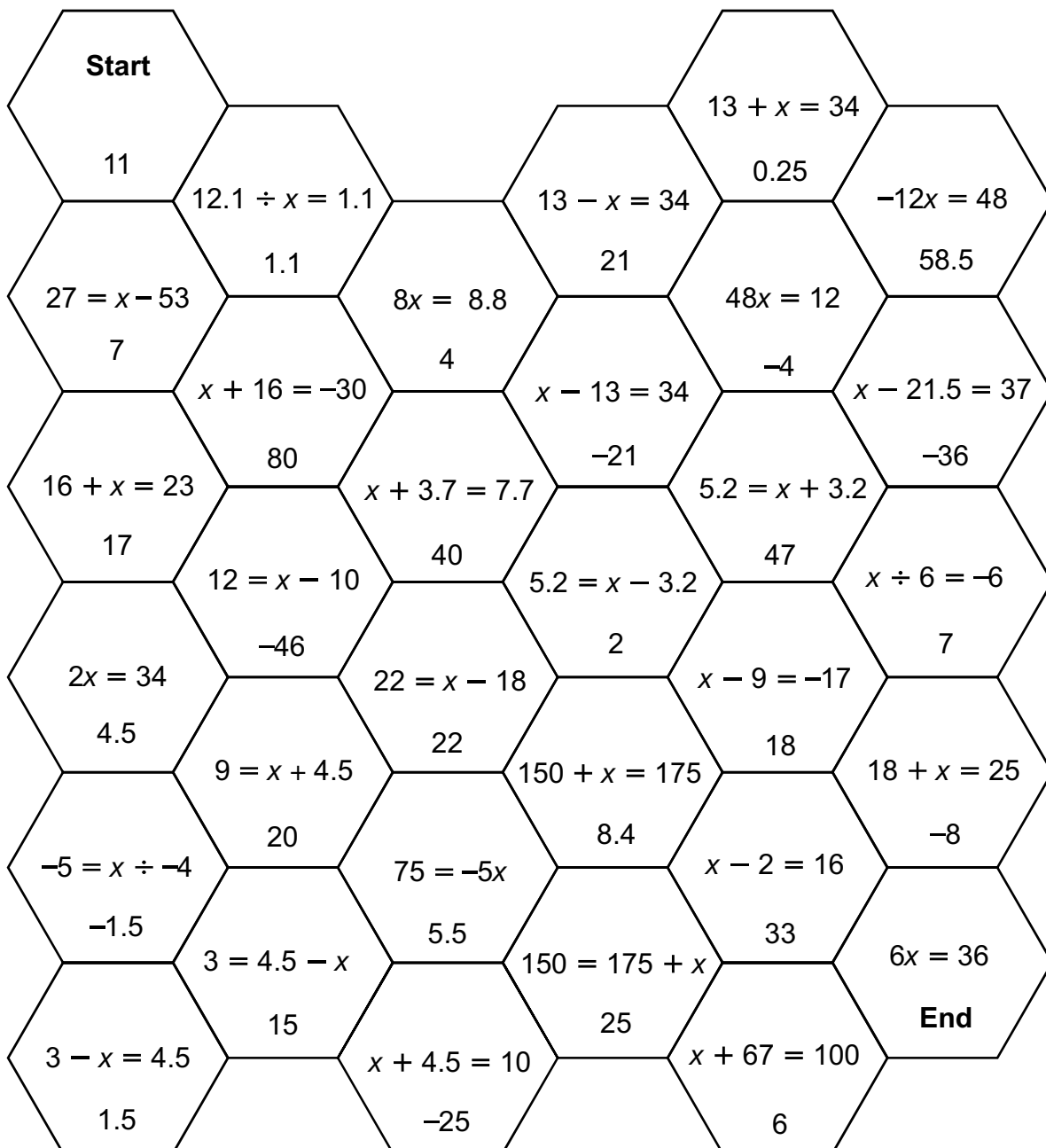
25. $|p| - 5 = 10$ _____

26. $8 - |r| = -2$ _____

ENRICHMENT 2-4**HEXA-MAZE**

This figure is called a *hexa-maze* because each cell has the shape of a hexagon.

To solve the maze, start with the number in the top left corner. This number must be the solution of the equation in the next cell. The number in the new cell will then be the solution to the equation in the next cell. At each move, you may only move to an adjacent cell. Each cell is used only once.



RETEACHING 2-5**SOLVE MULTI-STEP EQUATIONS**

When you solve an equation requiring more than one property of equality, use the addition property before you use the multiplication property.

Example

Solve $5(x - 3) = 15 + 2x$.

Use Algeblocks to model each step if you wish. Check the solution.

Solution**Algebraic Notation**

$$\begin{aligned} 5(x - 3) &= 15 + 2x \\ 5x - 15 &= 15 + 2x \\ -2x + 5x - 15 &= 15 + 2x + (-2x) \\ 3x - 15 &= 15 \\ 15 + 3x - 15 &= 15 + 15 \\ 3x &= 30 \\ \frac{1}{3}(3x) &= 30\left(\frac{1}{3}\right) \\ x &= 10 \end{aligned}$$

Check: $5(x - 3) = 15 + 2x$
 $5(10 - 3) = 15 + 2(10)$
 $35 = 35$

Explanation and Steps When Using Algeblocks

Represent the equation.

Apply the distributive property.

Add $-2x$ to each side.

Simplify.

Add 15 to each side.

Simplify.

Multiply each side by $\frac{1}{3}$.

Simplify.

The solution is 10.

EXERCISES

Solve each equation and check the solution. Use Algeblocks to model each step if you wish.

- | | |
|--------------------------------|---------------------------------|
| 1. $3x + 2 = 17$ _____ | 2. $2x + 1 = 4x - 3$ _____ |
| 3. $5(x + 2) = 9 + 16$ _____ | 4. $9x - 17 = -71$ _____ |
| 5. $2x + 8 = 3x - 12$ _____ | 6. $6(x - 3) = -4 + 10$ _____ |
| 7. $4(2x + 1) = 28 - 16$ _____ | 8. $7x + 14 = 5x - 6$ _____ |
| 9. $8x + 12 = 36$ _____ | 10. $6x - 5 = -35$ _____ |
| 11. $x + 9 = 3x - 15$ _____ | 12. $4(3x - 1) = x + 40$ _____ |
| 13. $4x + 5 = 49$ _____ | 14. $3(3x - 9) = 12 + 15$ _____ |
| 15. $3x - 18 = 42$ _____ | 16. $5x - 2 = 2x + 16$ _____ |

EXTRA PRACTICE **2-5****SOLVE MULTI-STEP EQUATIONS****EXERCISES**

Solve each equation and check the solution.

1. $2c + 3 = 15$ _____
2. $-3s + 4 = -2$ _____
3. $-14 = 4d + 6$ _____
4. $19 = 25 - 3w$ _____
5. $2(b + 3) = 2$ _____
6. $5y + 3 = 2y + 12$ _____
7. $5 - 2x = x - 19$ _____
8. $7t - 5 + 3t = 15$ _____
9. $2 - 3(m + 4) = 2$ _____
10. $1 - 6r = -4 - 3r$ _____
11. $\frac{1}{3}(6p - 12) = 5$ _____
12. $4(0.5 - w) = -18$ _____

Translate each sentence into an equation. Then solve.

13. Six more than twice a number is 16. Find the number. _____
14. Four times a number decreased by 12 is 8. Find the number. _____
15. When 15 is decreased by three times a number, the result is 21. Find the number.

16. Eight more than five times a number is the same as one less than eight times the number. Find the number. _____
17. When the sum of twice a number and 2 is multiplied by 3, the result is the same as 4 times the sum of the number and 4. Find the number.

Solve each equation and check the solutions.

18. $-3(r + 5) = 3(r - 1)$ _____
19. $\frac{1}{2}(4m + 8) = \frac{1}{3}(3m - 3)$ _____
20. $6(2 - 3x) + 8 = 2 - 9x$ _____
21. $3 - 10k = -3(5k + 2) - 4k$ _____
22. Juan bought 4 T-shirts and a leather jacket. The T-shirts were all the same price, and the price of the leather jacket was 6 times the cost of one T-shirt. If the total cost of the T-shirts and the leather jacket was \$209.00, what was the price of each T-shirt? _____

ENRICHMENT 2-5**IDENTITIES**

An equation that is true for every value of the variable is called an **identity**. When you try to solve an identity, you end up with a statement that is always true. Here is an example.

Example

Solve $8 - (5 - 6x) = 3(1 + 2x)$.

$$8 - (5 - 6x) = 3(1 + 2x)$$

$$8 - 5 - (-6x) = 3(1 + 2x)$$

$$8 - 5 + 6x = 3 + 6x$$

$$3 + 6x = 3 + 6x$$

EXERCISES

State whether each equation is an identity. If it is not, find its solution.

1. $2(2 - 3x) = 3(3 + x) + 4$

2. $5(m + 1) + 6 = 3(4 + m) + (2m - 1)$

3. $(5t + 9) - (3t - 13) = 2(11 + t)$

4. $14 - (6 - 3c) = 4c - c$

5. $3y - 2(y + 19) = 9y - 3(9 - y)$

6. $3(3h - 1) = 4(h + 3)$

7. Use the true equation $3x - 2 = 3x - 2$ to create an identity of your own.

8. Use the false equation $1 = 2$ to create an equation with no solution.

9. Create an equation whose solution is $x = 3$.

RETEACHING 2-6

SOLVE LINEAR INEQUALITIES

The steps used to solve an inequality are similar to those used to solve an equation. When an inequality is multiplied by a negative number, the order of the inequality is reversed.

Example 1

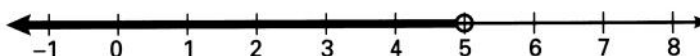
Solve $2x < 10$ and graph its solution on a number line.

Solution

Solve the inequality. Graph the inequality.

$$\begin{aligned} 2x &< 10 \\ \frac{1}{2}(2x) &< 10\left(\frac{1}{2}\right) \\ x &< 5 \end{aligned}$$

The solution is $x < 5$.



Example 2

Graph $y > 4x - 2$ on the coordinate plane.

Solution

Write the related equation.

$$y = 4x - 2$$

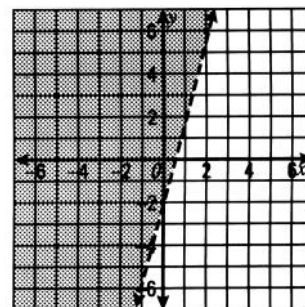
Make a table of values (ordered pairs) to graph the boundary.

The boundary is a broken line because the boundary is not part of the solution set.

Determine the shading.

Test point: $(0, 0) \ y > 4x - 2 \rightarrow 0 > 4(0) - 2 \rightarrow 0 > -2$.

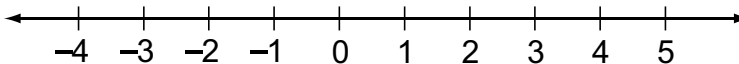
x	y
-1	-6
0	-2
1	2



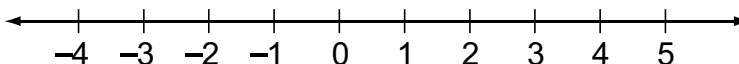
EXERCISES

Solve each inequality and graph its solution on the number line.

1. $3x - 2 \leq 7$ _____

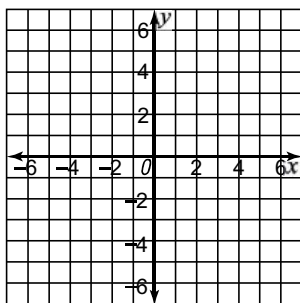


2. $9 < 5x - 1$ _____

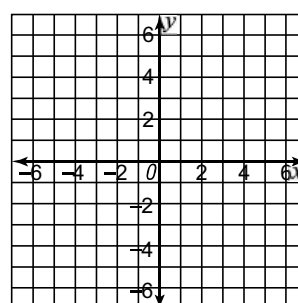


Graph each inequality on the coordinate plane.

3. $2x - 2y \geq -2$



4. $y < 2x - 3$



EXTRA PRACTICE **2-6****SOLVE LINEAR INEQUALITIES****▣ EXERCISES**

Solve each inequality and graph the solution on a number line.

Use your own paper.

1. $2d + 1 \geq 13$ _____

2. $8 - 3r < -4$ _____

3. $14 \leq 5a + 4$ _____

4. $-5k - 3 > 12$ _____

5. $-10 - 6z \leq 20$ _____

6. $6r - 4 < -10$ _____

7. $\frac{1}{2}q + 4 > 1$ _____

8. $5 - 2k \leq -19$ _____

9. $5n - 6 \leq 12 - n$ _____

10. $8 - z > 2z - 10$ _____

Graph each inequality on the coordinate plane. Use your own paper.

11. $y < 2x$

12. $y \leq 5$

13. $x \leq -1$

14. $y \geq x + 3$

15. $y \leq -x - 2$

16. $x - y < 4$

17. $x \leq 2y - 6$

18. $9 < 6x - 3y$

19. $4x + 2y \leq 10$

20. $y < \frac{3}{4}x + 1$

21. $2x + \left(\frac{2}{3}\right)y \leq 4$

22. $8 < 5x - 3y$

23. Five times some number n decreased by 3 is greater than 7. What values are possible for n ? _____

24. Twelve less than four times some number n is at least three more than the number. What values are possible for n ? _____

25. Six minus twice a number n is less than or equal to the opposite of one-half the number. What values are possible for n ? _____

Solve each inequality and graph the solution on a number line. Use your own paper.

26. $0.6m - 8.3 \geq 0.9 - 91.4m$ _____

27. $4 - (r + 3) \leq 3(2r - 13) - 2$ _____

28. $3(2a + 5) - 6a < 2(3 - 3a)$ _____

29. $4(2b - 1) > 4b + 3(b + 2) - 7$ _____

ENRICHMENT 2-6**CONSECUTIVE INTEGERS**

Consecutive integers are integers that follow in order. For example, $-3, -1, 1, 3$ is a set of consecutive odd integers. You can use algebraic expressions to solve problems about consecutive integers. In solving these problems, you will need to translate certain statements into expressions. Here are some examples.

Statement “sum of five consecutive integers”
Expression $n + (n + 1) + (n + 2) + (n + 3) + (n + 4)$

Statement “sum of five consecutive even integers”
Expression $2n + (2n + 2) + (2n + 4) + (2n + 6) + (2n + 8)$

Statement “sum of five consecutive odd integers”
Expression $(2n + 1) + (2n + 3) + (2n + 5) + (2n + 7) + (2n + 9)$

EXERCISES

Solve each problem.

- Find three consecutive integers that have a sum of -12 .

- Find two consecutive integers that have a sum of 17 .

- Find three consecutive integers that have a sum of 72 .

- Find two consecutive integers that have a sum of 95 .

- Find three consecutive odd integers with a sum of 615 .

- Find four consecutive odd integers with a sum of -80 .

- Find two consecutive even integers with a sum of 70 .

- Find three consecutive even integers with a sum of -18 .

- The larger of two consecutive even integers is 6 less than 3 times the smaller integer. Find the integers.

- Find four consecutive even integers such that the largest is twice as large as the smallest.

RETEACHING 2-7

DATA AND MEASURES OF CENTRAL TENDENCY

Data can be organized using a tally system in a frequency table. Mean, median, and mode are measures of central tendency and can be used to analyze data.

Example

The following are a baseball team's scores for ten games:
4, 3, 0, 3, 2, 0, 1, 1, 3, 3.

- a. Construct a frequency table for the data.
- b. Find the mean, median and mode for the data.

Solution

- a. List each different data item. Make a tally to record the number of times each data item occurs. Total the tally marks to compute the frequency of each response.
- b. **Mean:** divide the sum of the data by the number of data items.

$$\frac{0 + 0 + 1 + 1 + 2 + 3 + 3 + 3 + 3 + 4}{10} = \frac{20}{10} = 2$$

Median: the middle value of the data.

0, 0, 1, 1, 2, 3, 3, 3, 3, 4. Since the number of data items is even, the median is the average of the two middle numbers:

$$\frac{2 + 3}{2} = \frac{5}{2} = 2.5.$$

Mode: the number that occurs most frequently. The mode is 3.

Runs	Tally	Freq
0		2
1		2
2		1
3		4
4		1

EXERCISES

Construct a frequency table for each set of data. Then find the mean, median, and mode.

1. 100, 103, 103, 100, 103, 103, 100, 104

Mean: _____

Median: _____

Mode: _____

No.	Tally	Freq

2. 215, 214, 212, 211, 212, 215, 215, 210

Mean: _____

Median: _____

Mode: _____

No.	Tally	Freq

EXTRA PRACTICE **2-7****DATA AND MEASURES OF CENTRAL TENDENCY****▣ EXERCISES**

Twenty students were randomly sampled and surveyed as to the number of hours per week they study. The results are shown below.

5 6 5 2 4 6 3 2 1 5
4 4 6 3 3 5 2 1 6 4

1. Construct a frequency table for these data.

2. Find the mean, median, and mode of the data _____

The number of hours worked in one week by employees at The Print Shop are listed below.

25 36 18 43 40 38 39 40 16
20 24 29 30 45 42 19 20 28

3. Construct a frequency table for these data. Group the data into intervals.

4. Which interval contains the median of the data? _____

ENRICHMENT 2-7

THE AVERAGE AREA

One way to estimate the area of a curved shape is to find the arithmetic average of two areas—the inner area and the outer area.

Example

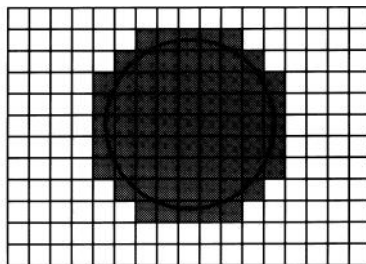
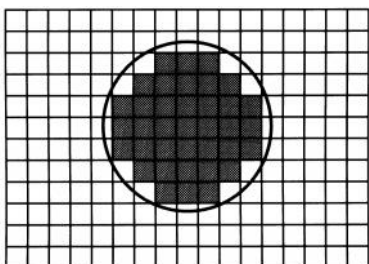
Estimate the area of the circle drawn on the grid.

Solution

Inner Area 37 sq units

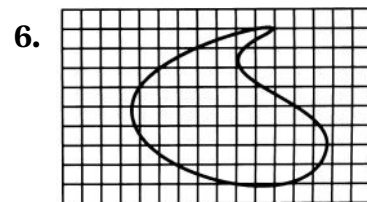
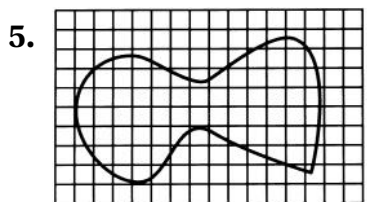
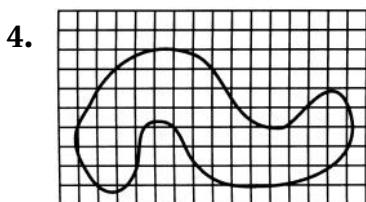
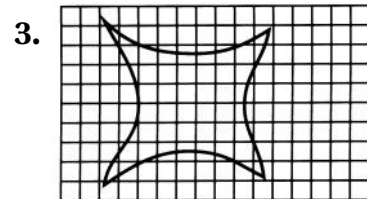
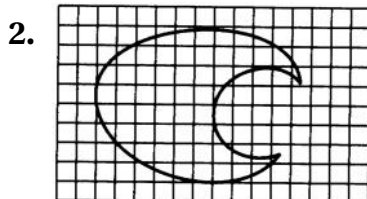
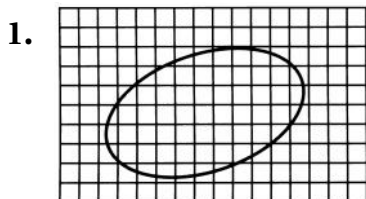
Outer Area 69 sq units

Average
 $37 + 69 = 106$
 $106 \div 2 = 53$
 53 sq units

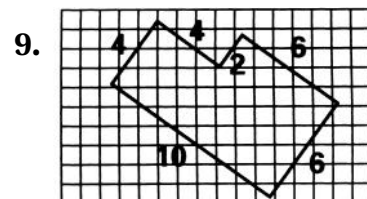
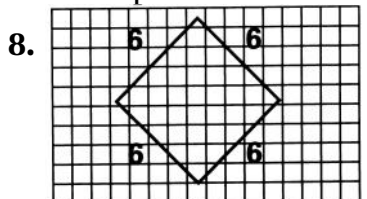
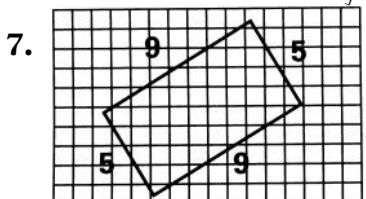


EXERCISES

Estimate the area of each figure.



For each figure, estimate the area by averaging. Then compute the area using the formula $A = lw$. How do your results compare?



RETEACHING 2-8
DISPLAYING DATA

Stem-and-leaf plots and histograms are two ways to display data.

Example

The test scores for the math exam were as follows: 75, 87, 68, 63, 45, 76, 75, 88, 87, 89, 93, 95, 98, 70, 72, 75, 82, 83, 66, 66.

- a. Construct a stem-and-leaf plot to display the data.
- b. Identify any outliers, clusters, or gaps in the data.
- c. Group the data into intervals of 20. Construct a histogram to display the data.

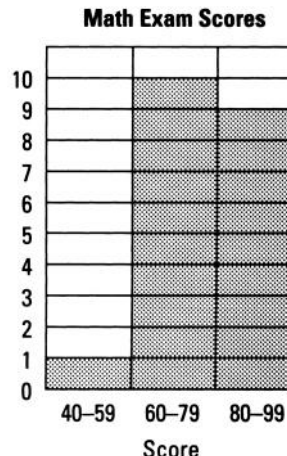
Solution

- a. The tens digit will be the stem. The units digit will be the leaf.
- b. The outlier is 45 since it is the only score that is much less or much greater than the other data. The remaining data are clustered between 63 and 98. The only gap is between 45 and 63.
- c. The data must be grouped into intervals of 20. Use the grouping from the stem-and-leaf plot, combining stems 4 and 5, 6 and 7, and 8 and 9.

Math Exam Scores

4	5
5	
6	3 6 6 8
7	0 2 5 5 5 6
8	2 3 7 7 8 9
9	3 5 8

Key: 4|5 represents a score of 45.



EXERCISES

For each data group below, **a.** construct a stem-and-leaf plot to display the data, **b.** identify any outliers, clusters, or gaps in the data, and **c.** use the stem-and-leaf plot to help group the data into intervals of 20. Then construct a histogram on your own paper.

1. Ages at Recital
 17, 28, 36, 32, 65,
 45, 21, 16, 29, 17,
 23, 34, 42, 44, 19

2. Cost of in-line skates (in dollars)
 142, 163, 125, 126, 128,
 146, 101, 131, 130, 129,
 131, 125, 143, 132, 141

a. Ages at Recital

b. Outlier _____

a. Cost of in-line skates

b. Outlier _____

Cluster _____

Gaps _____

Cluster _____

Gaps _____

EXTRA PRACTICE 2-8

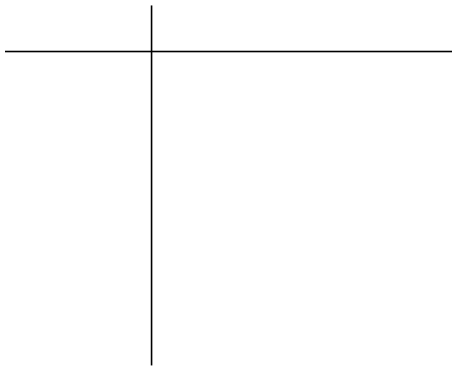
DISPLAYING DATA

EXERCISES

The ages of instructors at a health club are listed below.

24 28 29 35 37 22 48 56 42 47
 20 66 43 40 19 18 25 29 30 32

- Construct a stem-and-leaf plot to display the data.



- Identify any outliers, clusters, and gaps in the data.

- Find the mode of the data. _____
- Find the median of the data. _____
- Find the mean of the data. _____

Refer to the histogram for Exercises 6–9.

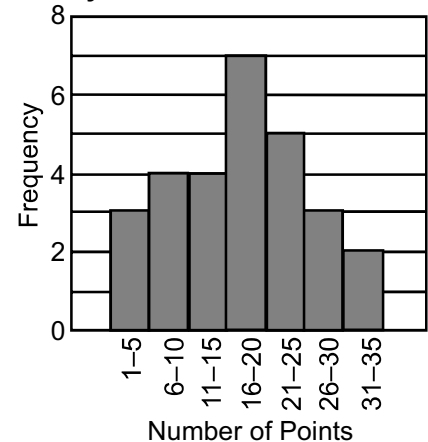
- How many players scored 15 points or fewer?

- What percent of the players scored between 11 and 25 points?

- Which interval contains the median number of points scored?

- Is it possible to identify the mean of the data? Explain.

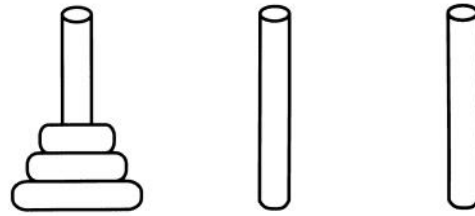
Points Scored During a Tournament by Members of the Monroe High School Boy's and Girl's Basketball Team



ENRICHMENT 2-8

THE TOWER OF HANOI

The Tower of Hanoi is a peg-and-disk puzzle. Some number of disks are placed on one of three pegs. The object is to move all the disks to another peg. Only one disk may be moved at a time. And, a larger disk may never be placed on top of a smaller one.



To work the puzzle, numbered counters may be used. Here is the initial arrangement for the two-disk version. Remember, a larger number may never be on top of a smaller number.



Peg A

Peg B

Peg C

EXERCISES

1. Solve the puzzle for 2 disks. Find two different solutions.

Peg A	Peg B	Peg C

Peg A	Peg B	Peg C

2. Solve the puzzle for 3 disks.

Peg A	Peg B	Peg C

RETEACHING 2-9

PROBLEM SOLVING SKILLS: MISLEADING GRAPHS

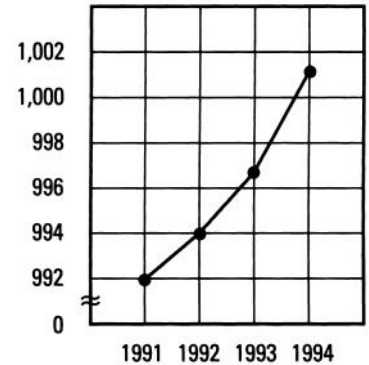
Statistics can be useful when used properly. However, they can be misleading when the scales of graphs are manipulated, measures of central tendency are used that don't accurately relate the data, or advertisements omit data.

Example

A high school principal used the graph at the right to illustrate the gains in mean test scores over a four-year period.

- a. What is deceptive about the graph?
- b. How would you change the graph so that it is not misleading?

Mean Test Scores Soar



Solution

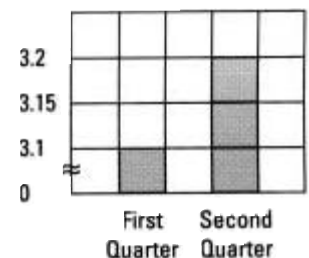
- a. The small gains in the mean scores appear more significant in the graph because of the slope of the line. This happens because: a) the break between 0 and 992 makes the first 992 points visually appear as though they are equal to 2 points, b) the dates on the horizontal scale are squeezed closely together making the line steeper and causing the increase to appear more significant.
- b. You could use a vertical scale that has consistent intervals from 0–1002. The dates on the horizontal scale could be written somewhat farther apart. You might also eliminate the word 'soar' from the title of the graph.

EXERCISES

Solve.

- 1. Describe how the graph at the right is deceptive. How would you change it so that it is not misleading?

Lou's Grade Point Average



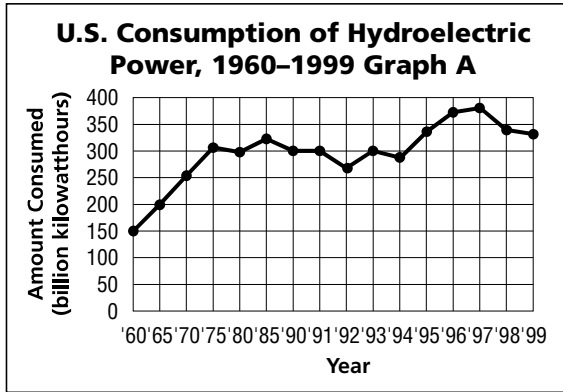
- 2. On another sheet of paper, make two graphs that show the increase in a high-school population for the next five years if it is estimated that there will be a 25-student increase per year. Use one graph to support claims of overcrowding and the other to support claims that the growth is controlled. Explain why each graph supports each position.

EXTRA PRACTICE 2-9

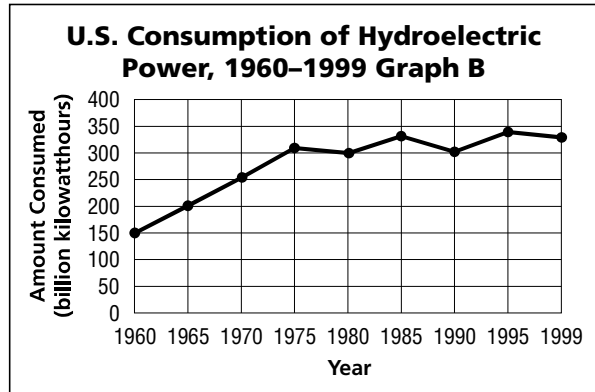
MISLEADING STATISTICS

EXERCISES

For Exercises 1–3, refer to the graphs below.

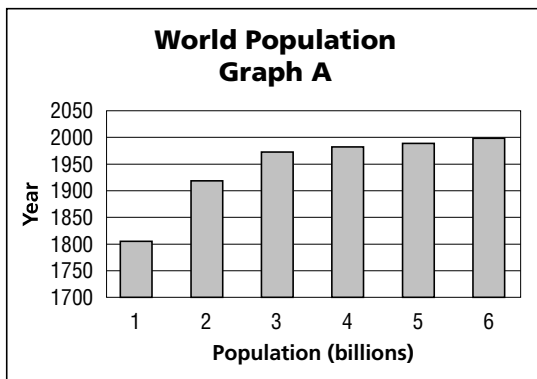


Source: Energy Information Administration

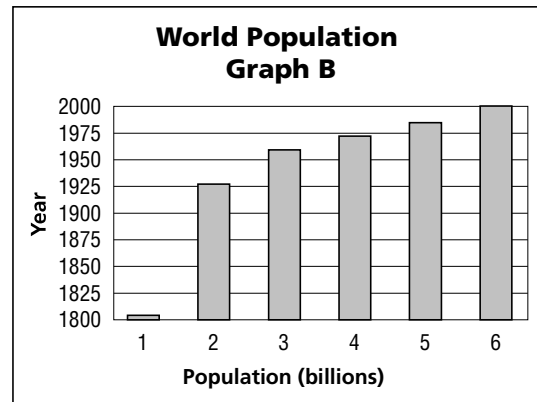


Source: Energy Information Administration

1. What was the U.S. consumption of hydroelectric power in 1990? _____
2. Which graph gives the impression that the use of hydroelectric power in the United States has experienced many dips as well as rises between 1975 and 1999? _____
3. What causes the graphs to differ in their appearance? _____



Source: www.pbs.org



Source: www.pbs.org

For Exercises 4–6, refer to the graphs below.

4. What was the world's population in 1999? _____
5. Which graph gives the impression that the world's population skyrocketed between 1800 and 1925? Explain. _____
6. Are the vertical axis and the horizontal axis in either graph misleading? Explain. _____

ENRICHMENT 2-9

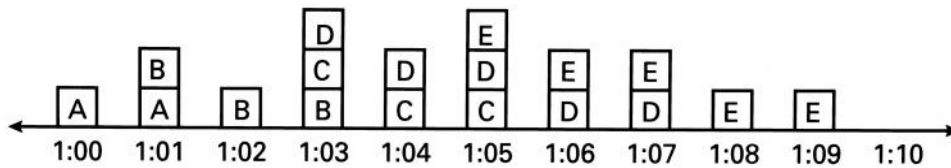
THE QUEUE UP

A *queue* is a line of people waiting to be served. To *queue up* means to form a line. There is an entire branch of mathematics dealing with the study of queues.

Example

Draw a line plot for the chart at the right. You are to assume it takes 2 minutes for each customer to be served.

Arrival Time	1:00	1:01	1:02	1:03	1:04	1:05
Customer	A	B		C, D		E

Solution

The waiting times of the 5 customers are 2, 3, 3, 5, and 5 minutes, respectively.

EXERCISES

Draw a line plot for each chart. Assume it takes 3 minutes for each customer to be served. Give the waiting times of the customers.

1.

Arrival Time	1:00	1:01	1:02	1:03	1:04
Customer	A, B			C	D

2.

Arrival Time	1:00	1:01	1:02	1:03	1:04
Customer	A	B, C			D

BLANK

Name _____

Date _____

CHAPTER 2 GROUP PROJECT PLANNER

Assignment _____

Objective _____

Group Members

Assigned Roles

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Benchmarks

Deadlines

Done

- a) _____
- b) _____
- c) _____
- d) _____

ROLE

FUNCTION IN THE GROUP

Leader

- keeps group members focused on the assigned task
- makes sure all have opportunity to participate and learn
- makes sure all respect fellow group members
- makes sure all understand the assignment

Recorder

- maintains group files and folders
- keeps records of all group activities
- keeps records of materials contributed by group members
- writes out solutions to problems
- prepares materials for class presentations

Reporter

- delivers responses to the class about the group activities
- presents conclusions to class

Monitor

- acts as the timekeeper for timed activities
- makes sure group work area is cleaned up
- makes sure materials remain organized

Wildcard

- assists the Leader
- assumes role of any member who is absent

CHAPTER 2 PROJECT PLANNING CALENDAR

<p>Benchmarks</p> <ol style="list-style-type: none"> Working together, think of a positive change that you would like to make at your school or in your community. What kind of data would encourage others to adopt your proposal? Make a list of the data you will need. (<i>Lesson 2-3</i>) Think about how you will use the media to convince the public to support your message. Write a public relations plan and a budget. Estimate the cost of any advertisements or commercials you will need to run in local newspapers or on television. (<i>Lesson 2-5</i>) Develop a survey question to ask your classmates that could provide you with data to support your proposal. Collect the data, construct a frequency table, and draw the related histogram. Write a paragraph analyzing your results. (<i>Lesson 2-8</i>) Create an advertisement for your school or community newspaper to promote your proposal. Include your survey question, the histogram of the data you collected, and a paragraph that will convince people to support your proposal. (<i>Chapter Investigation Extension</i>) 	<p>PROJECT GOAL</p> <p>To collect and use data to write an advertisement to promote a proposed change to your school or community.</p>
--	---

Use the calendar to plan how many days to allow for each project benchmark.

IMPROVING YOUR WORLD

Day 1	Day 2	Day 3	Day 4	Day 5
Day 6	Day 7	Day 8	Day 9	Day 10
Day 11	Day 12	Day 13	Day 14	Day 15
Day 16	Day 17	Day 18	Day 19	Day 20

CHAPTER 2
ESSENTIAL ALGEBRA
AND STATISTICS

Name _____

Date _____

ASSESSMENT FORM A, PAGE 1

Scoring Record	
Possible: 32	Earned:

Find the next three terms in each sequence.

1. 12, 8, 4, 0 _____

2. 3, -6, 12, -24 _____

3. 0, 1, 4, 9 _____

4. 15, 14, 12, 9 _____

Determine whether each relation is a function. Write *yes* or *no*. Then find its domain and range.

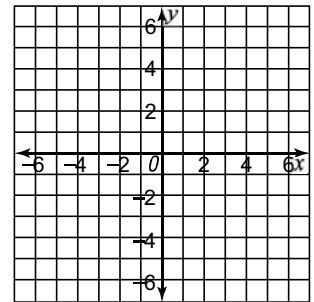
5. $\{(2, 3), (2, 4), (3, 4), (4, 3)\}$ Function _____ Domain _____ Range _____

6. $\{(8, 9), (9, 9), (7, 5), (6, 3)\}$ Function _____ Domain _____ Range _____

Given $f(x) = 2x + 1$ and $g(x) = 3x - 2$, evaluate each function.

7. $f(2)$ _____ 8. $g(3)$ _____ 9. $f(7) - g(-2)$ _____

10. Graph the function $y = 3x - 2$.



Evaluate $h(x) = |3x - 4|$ for the given value of x .

11. $h(6)$ _____ 12. $h(0)$ _____ 13. $h(-5)$ _____

Solve each equation.

14. $6 + a = -5$ _____

15. $\frac{b}{3} = -27$ _____

16. $c - \frac{1}{6} = \frac{5}{6}$ _____

17. $d + 9 = 8$ _____

18. $7x = 49$ _____

19. $17 = j + 1$ _____

20. $5k - 6 = 19$ _____

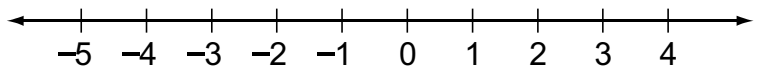
21. $\frac{1}{2}(l - 2) = 9$ _____

22. $3(4m - 6) = -6 + 24$ _____

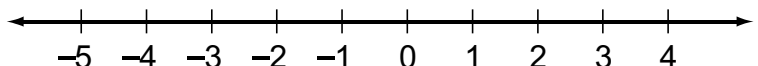
23. $2(q + 1) = q - 3$ _____

Solve each inequality and graph the solution on a number line.

24. $5r + 9 \geq -1$ _____

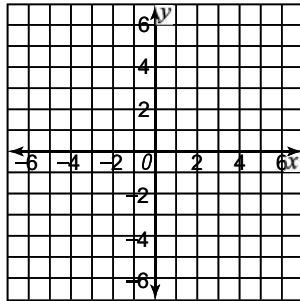


25. $-8 < \frac{1}{2}s - 6$ _____

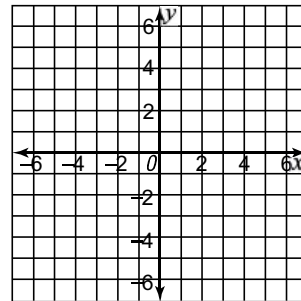


Graph each inequality on the coordinate plane.

26. $5x - y \leq -2$



27. $\frac{2}{5}x + \frac{1}{5}y > 1$



A random survey of working students showed their weekly part-time work hours as: 9, 16, 12, 13, 11, 11, 15, 20, 12, 11.

28. Construct a frequency table for the data.

29. Find the measures of central tendency.

Mean _____ Median _____ Mode _____

Weekly Hours

Hrs	Tally	Freq
9		1
10		0
11		3
12		2
13		1
14		0
15		1
16		1
17		0
18		0
19		0
20		1

A survey found their last hourly raise (in cents) to be: 25, 10, 15, 0, 40, 20, 5, 20, 12, 15.

30. Construct a stem-and-leaf plot to display the data.

31. Identify any outliers, clusters, and gaps.

Outliers _____

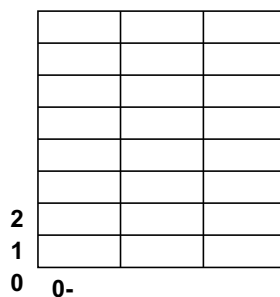
Clusters _____

Gaps _____

32. Group the data into intervals of 20. Construct a histogram.

Wage Increase

0	
1	



CHAPTER 2
ESSENTIAL ALGEBRA
AND STATISTICS

Name _____

Date _____

ASSESSMENT FORM B, PAGE 1

Scoring Record	
Possible: 32	Earned:

Find the next three terms of each sequence.

1. 1, 4, 7, 10 _____ 2. 1, -3, 9, -27 _____
 3. 0, 1, 8, 27 _____ 4. 1, 3, 6, 10 _____

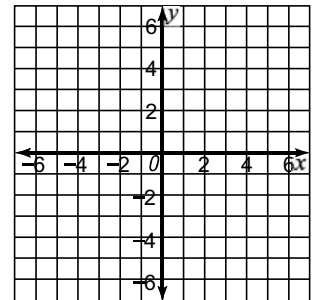
Determine whether each relation is a function. Write *yes* or *no*. Then find its domain and range.

5. $\{(4,1), (5, 1), (1, 5), (2, 2)\}$ Function _____ Domain _____ Range _____
 6. $\{(1, 5), (1, 6), (2, 7), (3, 8)\}$ Function _____ Domain _____ Range _____

Given $f(x) = 4x - 2$ and $g(x) = x + 3$, evaluate each function.

7. $f(-1)$ _____ 8. $g(9)$ _____ 9. $f(3) - g(4)$ _____

10. Graph the function $y = 4x + 1$.



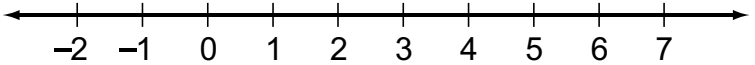
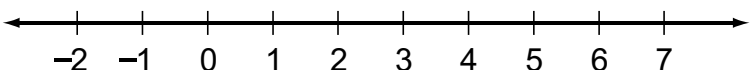
Evaluate $h(x) = |x + 1|$ for the given value of x .

11. $h(4)$ _____ 12. $h(0)$ _____ 13. $h(-2)$ _____

Solve each equation.

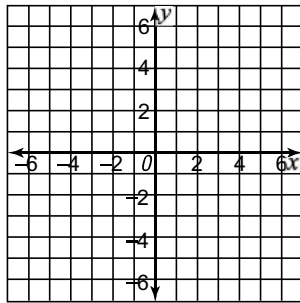
14. $9 - a = -3$ _____ 15. $\frac{b}{4} = 16$ _____ 16. $c - \frac{2}{5} = \frac{3}{5}$ _____
 17. $d - 15 = 23$ _____ 18. $9x = 108$ _____ 19. $53 = j + 17$ _____
 20. $4k + 7 = 39$ _____ 21. $\frac{1}{3}(l - 6) = 19$ _____
 22. $2(2m + 5) = 75 + 15$ _____ 23. $7(q + 2) = q + 14$ _____

Solve each inequality and graph the solution on a number line.

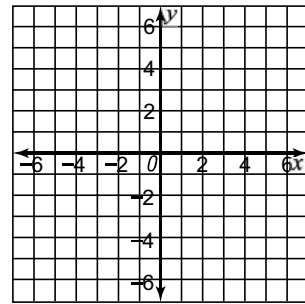
24. $4 \leq 2r - 6$ _____ 
 25. $-\frac{1}{4}s + 4 > 3$ _____ 

Graph each inequality on the coordinate plane.

26. $6x - 2y < 4$



27. $\frac{1}{3}x + \frac{1}{3}y \geq -1$



One student's scores for the past ten math quizzes were:
96, 91, 93, 86, 89, 89, 93, 93, 93, 87.

28. Construct a frequency table for the data.

29. Find the measures of central tendency.

Mean _____ Median _____ Mode _____

Math Quiz Scores

Another student's scores were: 48, 83, 77, 61, 93, 65, 73, 87, 88, 96.

30. Construct a stem-and-leaf plot to display the data.

31. Identify any outliers, clusters, and gaps.

Outliers _____

Clusters _____

Gaps _____

Math Quiz Scores

4	
5	

32. Group the data into intervals of 20. Construct a histogram.

Math Quiz Scores

8			
7			
6			
5			
4			
3			
2			
1			

40-

ESSENTIAL ALGEBRA AND STATISTICS

STANDARDIZED TEST PRACTICE

Name _____

Date _____

Scoring Record	
Possible: 21	Earned:

1. Which is the correct roster notation for $\{x|x \text{ is a negative integer and } x < -3\}$?

A. $\{-2, -1\}$
 B. $\{\dots -3, -2, -1, 0\}$
 C. $\{-2, -1, 0\}$
 D. $\{\dots -6, -5, -4\}$
 E. none of these

2. Which number is not a rational number?

A. $\sqrt{11}$ B. $\sqrt{36}$
 C. 0.75 D. $-\frac{1}{2}$
 E. -3

3. If $A = \{4, 9, 12\}$ and $B = \{3, 6, 9\}$ find $A \cup B$.

A. $\{3, 4, 6, 9, 12\}$ B. $\{4, 9, 12\}$
 C. $\{3, 6, 9\}$ D. $\{9\}$
 E. $\{3, 4, 6, 12\}$

4. Multiply: $\frac{1}{8}(-24)$

A. 3 B. 2
 C. -192 D. -2
 E. none of these

5. Simplify: $x^5 \cdot x^3$

A. x^{15} B. $\frac{1}{x^{10}}$
 C. x^8 D. x^2
 E. none of these

6. Simplify: $(x^2)^{-5}$

A. x^{-3} B. $\frac{1}{x^{10}}$
 C. x^8 D. x^{10}
 E. none of these

7. Evaluate x^{-3} if $x = 4$.

A. $-\frac{1}{64}$ B. $\frac{1}{64}$
 C. -12 D. $-\frac{1}{12}$
 E. 12

8. Write 0.0096 in scientific notation.

A. $9.6 \cdot 10^3$ B. $9.6 \cdot 10^{-2}$
 C. $9.6 \cdot 10^{-3}$ D. $9.6 \cdot 10^{-4}$
 E. none of these

9. Write 7,600,000 in scientific notation.

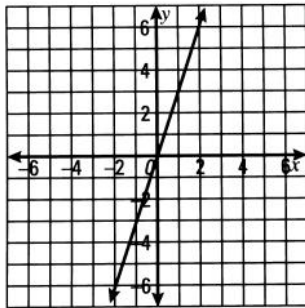
- A. $7.6 \cdot 10^5$ B. $7.6 \cdot 10^{-6}$
 C. $7.6 \cdot 10^{-5}$ D. $7.6 \cdot 10^6$
 E. $7.6 \cdot 10^7$

10. If $f(x) = 2x + 3$, find $f(-6)$.

- A. -9 B. 15
 C. -3 D. -1
 E. none of these

11. Which function is shown by the graph?

- A. $y = 2x + 1$
 B. $y = 3x$
 C. $y = 3x - 1$
 D. $y = x + 3$
 E. $y = x$



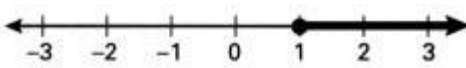

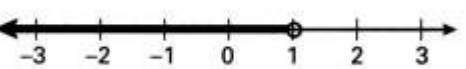
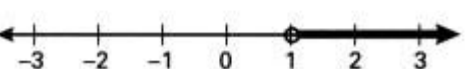
12. Solve the equation $\frac{2}{3}x = 24$

- A. 36 B. 16
 C. $23\frac{1}{3}$ D. $8\frac{2}{3}$
 E. none of these

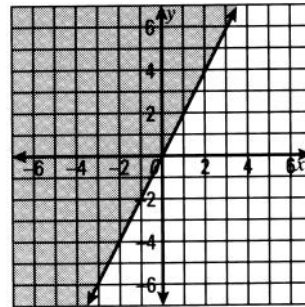
13. Solve the equation $3x + 1 = 2x - 9$.

- A. -2 B. -10
 C. -8 D. 2
 E. none of these

14. Which graph shows the solution of $2x + 4 < 6$?

- A. 
- B. 
- C. 
- D. 
- E. none of these

15. Which inequality is shown by the graph?



- A. $y > 2x$ B. $y < 2x$
 C. $y \geq 2x$ D. $y \leq 2x$
 E. $y \geq x$

16. Find the median of the following quiz scores: 76, 93, 98, 76, 88, 89, 90, 73, 81, 82.

- A. 153 B. 76
 C. 85 D. 84.6
 E. none of these

CHAPTER 2 STANDARDIZED TEST PRACTICE (continued)

EXTENDED RESPONSE

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem.

17. Phrase 1: x times y plus z
Phrase 2: x times the sum of y and z
- Discuss what is different between the two phrases.
 - Find values for x , y and z that make the two phrases equal.
18. a. Solve $\frac{ry + s}{m} - t = x$ for y , and explain each step in your solution.
- Would there be any limitations for the value of each variable? If so, explain the limitation.
19. You buy a stereo at a local store. The stereo has been discounted by 10%. The store then charges 10% tax.
- Compare the final price with the original price.
 - Would the final price be different if the tax was added first and then the discount was applied to this new amount?
20. Tony and Ivia started walking south from the same location at the same time. Ivia walked 8 miles and walked 1 mile per hour faster than Tony who walked 6 miles. They each walked for the same amount of time.
- Describe how a proportion could be used to find the rate that each person walked.
 - The next day they both walked 6 miles, and Ivia again walked 1 mile per hour faster than Tony, who walked 3 miles per hour. Determine whether a proportion could be used to find how long each person walked.
21. a. Write four equivalent equations to $x = 8$ using one of the four operations of addition, subtraction, multiplication and division for each equivalent equation. Use each operation only once.
- Write an equivalent equation to $x = 8$ that has the variable x on both sides.
 - Determine if $\frac{n}{6} = \frac{15}{18}$ and $2(n + 1) = 3(n - 1)$ are equivalent equations. Determine if either equation is equivalent to any of the equations created for parts **a** and **b**.

Standardized Test Practice

Student Record Sheet (Use with pages 98-99 of the Student Edition.)

Part 1 Multiple Choice

Select the best answer from the choices given and fill in the corresponding oval.

- | | | | |
|--|--|--|---|
| 1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 4. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 7. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 10. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 2. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 5. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 8. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | |
| 3. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 6. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 9. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | |

Part 2 Short Response/Grid In

Solve the problem and write your answer in the blank.

For Questions 12, 17, and 20, also enter your answer by writing each number or symbol in a box. Then fill in the corresponding oval for that number or symbol.

11. _____
12. _____ (grid in)
13. _____
14. _____
15. _____
16. _____
17. _____ (grid in)
18. _____
19. _____
20. _____ (grid in)

12.

•	/	/	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

17.

•	/	/	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

20.

•	/	/	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Part 3 Extended Response

Record your answers for Questions 21 and 22 on the back of this paper.