

Name: \_\_\_\_\_

Course/Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

## Chapter 3 Algebraic Expressions and Linear Equations

### 3.4 Solving Linear Equations

Linear Equations in One Variable ~ Solving Linear Equations Algebraically ~ Solving Linear Equations Numerically ~ Solving Linear Equations Visually

#### STUDY PLAN

**Read:** Read Section 3.4 on pages 172-180 in your textbook or eText.

**Practice:** Do your assigned exercises in your  Book  MyMathLab  Worksheets

**Review:** Keep your corrected assignments in an organized notebook and use them to review for the test.

#### Key Terms

*Exercises 1-6: Use the vocabulary terms listed below to complete each statement.*

*Note that some terms or expressions may not be used.*

horizontal axis  
vertical axis  
numerically  
visually

algebraic expression  
linear equation in one variable  
variable equation  
algebraically

1. When we solve an equation using the distributive property and the properties of equality, we are solving the equation algebraically.
2. For the graph of an expression  $ax + b$ , the horizontal axis shows the values of the variable  $x$ .
3. When we solve an equation using a table of values, we are solving the equation numerically.
4. A(n) linear equation in one variable is an equation that can be written in the form  $ax + b = 0$ , where  $a$  and  $b$  are constants (numbers) and  $a \neq 0$ .
5. When we solve an equation by estimating values from its graph, we are solving the equation visually.
6. For the graph of an expression  $ax + b$ , the horizontal shows the values of the expression  $ax + b$ .

**Linear Equations in One Variable**

*Exercises 1-4: Refer to Example 1 on page 173 in your text and the Section 3.4 lecture video.*

*Determine if each equation is linear. If so, give values for  $a$  and  $b$ .*

1.  $6x - 4 = 0$  1. \_\_\_\_\_

2.  $5x + 6 = 3$  2. \_\_\_\_\_

3.  $\sqrt{x} - 2 = 0$  3. \_\_\_\_\_

4.  $-3x + 8 = 0$  4. \_\_\_\_\_

**Solving Linear Equations Algebraically**

*Exercises 5-8: Refer to Examples 2-3 on pages 174-175 in your text and the Section 3.4 lecture video.*

*Solve each linear equation algebraically. Check your solution.*

5.  $4m + 2 = m - 10$  5. \_\_\_\_\_

6.  $13 - 2y - 7 = 3y - 12 + 4y$  6. \_\_\_\_\_

7.  $2(x - 5) + 3x = 15$  7. \_\_\_\_\_

8.  $4(y - 3) + 7 = 3(y + 2)$  8. \_\_\_\_\_

## Solving Linear Equations Numerically

**Exercise 9-10:** Refer to Example 4 on page 176 in your text and the Section 3.4 lecture video.

9. Complete the table for the given values of  $x$ . Then solve the equation  $3x + 7 = 4$ .

9. \_\_\_\_\_

$x$	-3	-2	-1	0	1
$3x + 7$					

10. Complete the table for the given values of  $x$ . Then solve the equation  $-2x + 3 = -1$ .

10. \_\_\_\_\_

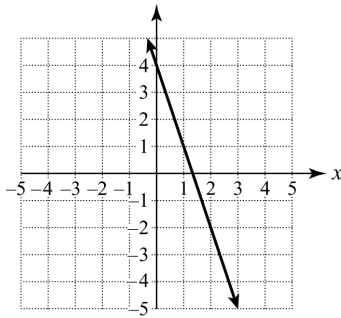
$x$	-1	0	1	2	3
$-2x + 3$					

## Solving Linear Equations Visually

**Exercises 11-12:** Refer to Example 5 on page 177 in your text and the Section 3.4 lecture video.

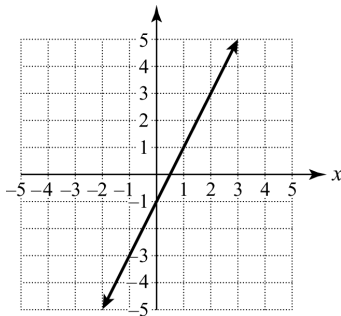
11. The graph of the expression  $-3x + 4$  is shown. Use the graph to solve the equation  $-3x + 4 = -2$  visually.

11. \_\_\_\_\_



12. The graph of the expression  $2x - 1$  is shown. Use the graph to solve the equation  $2x - 1 = -1$  visually.

12. \_\_\_\_\_



**Understanding Concepts through Multiple Approaches**

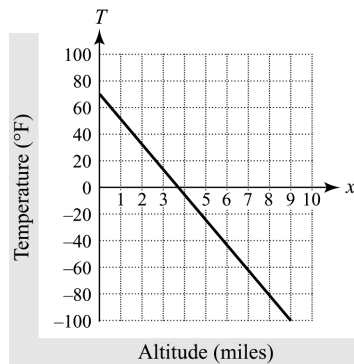
(For additional practice, visit MyMathLab.)

- 13. Altitude and Temperature** If the temperature on the ground is  $70^{\circ}\text{F}$ , then the air temperature  $T$  at an altitude of  $x$  miles is given by  $T = 70 - 19x$ . Find the altitude (in miles) where the air temperature is  $-6^{\circ}\text{F}$  by solving the linear equation  $-6 = 70 - 19x$ .

- (a) Solve algebraically.
- (b) Solve numerically using the table shown.

$x$	2	3	4	5	6
$70 - 19x$					

- (c) Solve visually using the graph shown.



Did you get the same result using each method? Which method do you prefer? Explain why.

# Answers:

## Vocabulary

- 1) algebraically
- 2) horizontal axis
- 3) numerically
- 4) linear equation in one variable
- 5) visually
- 6) vertical axis

- 1) yes,  $a=6$   $b=-4$
- 2) yes,  $a=5$ ,  $b=3$
- 3) no
- 4) yes,  $a=-3$ ,  $b=8$
- 5)  $m=-4$
- 6)  $y=2$
- 7)  $x=5$
- 8)  $y=11$

- 9)  $x = -1$
- 10)  $x = 2$
- 11)  $x = 2$
- 12)  $x = 0$
- 13) 6 miles - all sound be the same.