

Name: _____

Course/Section: _____

Instructor: _____

Chapter 13 Factoring Polynomials and Solving Equations
13.6 Solving Equations by Factoring I (Quadratics)

The Zero-Product Property ~ Solving Quadratic Equations ~ Applications

STUDY PLAN

Read: Read Section 13.6 on pages 834-840 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 1-5: Use the vocabulary terms listed below to complete each statement.

Note that some terms or expressions may not be used.

zeros
standard form
zero-product
quadratic equation
quadratic polynomial

1. The _____ property states that if the product of two numbers (or expressions) is 0, then at least one of the numbers (or expressions) must equal 0.
2. Any _____ in the variable x can be written as $ax^2 + bx + c$ with $a \neq 0$.
3. The _____ of a polynomial in x are the values that, when substituted for x , result in 0.
4. Any _____ in the variable x can be written as $ax^2 + bx + c = 0$ with $a \neq 0$.
5. The form $ax^2 + bx + c = 0$ is called the _____ of a quadratic equation.

The Zero-Product Property

Exercises 1-4: Refer to Example 1 on page 835 in your text and the Section 13.6 lecture video.

Solve each equation.

1. $x(x+2) = 0$ 1. _____

2. $3a^2 = 0$ 2. _____

3. $5(b+1)(b-4) = 0$ 3. _____

4. $x(x-3)(x+5) = 0$ 4. _____

Solving Quadratic Equations

Exercises 5-9: Refer to Examples 2-3 on pages 836-837 in your text and the Section 13.6 lecture video.

Solve each quadratic equation. Check your answers.

5. $x^2 + 4x = 0$ 5. _____

6. $t^2 = 9$ 6. _____

7. $a^2 - 5a + 6 = 0$ 7. _____

8. Solve $20x^2 + 14x = 24$

8. _____

9. Solve $2x^2 - 9x = 5$.

9. _____

Applications

Exercises 10-12: Refer to Examples 4-6 on pages 838-839 in your text and the Section 13.6 lecture video.

10. The height h in feet of a baseball after t seconds is given by $h(t) = -16t^2 + 88t + 4$. At what values of t is the height of the baseball 100 feet?

10. _____

11. The braking distance D in feet required to stop a car traveling at x miles per hour on wet, level pavement can be approximated by

$$D = \frac{1}{9}x^2.$$

- (a) Calculate the braking distance for a car traveling at 40 miles per hour. (Round to 2 decimal places as needed.)

11.(a) _____

(b) _____

- (b) If the braking distance is 60 feet, estimate the speed of the car. (Round to 2 decimal places as needed.)

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Chapter 13 Factoring Polynomials and Solving Equations
13.7 Solving Equations by Factoring II (Higher Degree)

Polynomials with Common Factors ~ Special Types of Polynomials

12. $x^4 + 12x^3$ 12. _____

13. $2x^3 - 12x^2 + 10x$ 13. _____

Solve each equation.

14. $6y^3 - y^2 - y = 0$ 14. _____

15. $4x^3 - 4x^2 = 120x$ 15. _____

Special Types of Polynomials

Exercises 6-10: Refer to Examples 4-5 on pages 845-846 in your text and the Section 13.7 lecture video.

Factor each polynomial completely.

16. $x^4 - 81$

16. _____

18. $a^4 + 6a^2 + 5$

18. _____

20. $a^4 - 16b^4$

20. _____

Vocabulary

- 1) Zero-product
- 2) quadratic polynomial
- 3) zeros
- 4) quadratic equation
- 5) standard form

- 1) $x = 0, -2$
- 2) $a = 0$
- 3) $b = -1, 4$
- 4) $x = 0, 3, -5$
- 5) $x = 0, -4$
- 6) $t = -3, +3$
- 7) $a = 2, 3$

8) $x = 4/5, -3/2$

9) $x = -1/2, 5$

10) 4 sec and 1.5 sec

11) a. 177.78ft b. 23.24 mph

12) $x^3(x+12)$

13) $2x(x-5)(x-1)$

14) $y = 0, -1/3, 1/2$

15) $x = 0, 6, -5$

16) $(x+3)(x-3)(x^2 + 9)$

17) NA

18) $(a^2+5)(a^2+1)$

19) NA

20) $(a-2b)(a+2b)(a^2 + 4b^2)$