

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

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

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

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

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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)**

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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. \_\_\_\_\_

19.  $2x^3 - 16$

19. \_\_\_\_\_

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)  $2(x-2)(x^2 + 2x + 4)$

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