

LESSON 13.4 Skills Practice**Problem Set**

Factor and solve each quadratic equation. Check your answer.

1. $x^2 + 5x + 6 = 0$

$$x^2 + 5x + 6 = 0$$

$$(x + 3)(x + 2) = 0$$

$$x + 3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x = -3 \quad \text{or} \quad x = -2$$

The roots are -3 and -2 .

Check:

$$(-3)^2 + 5(-3) + 6 = 0$$

$$9 - 15 + 6 = 0$$

$$0 = 0$$

$$(-2)^2 + 5(-2) + 6 = 0$$

$$4 - 10 + 6 = 0$$

$$0 = 0$$

2. $x^2 - 3x - 4 = 0$

3. $m^2 + 2m - 35 = 0$

4. $-x^2 - 4x + 12 = 0$

5. $x^2 + 8x = 0$

6. $w^2 + 50 = -15w$

Determine the zeros of each quadratic function, if possible. Check your answer.

11. $f(x) = x^2 - 5x$

$f(x) = x^2 - 5x$

$0 = x^2 - 5x$

$0 = x(x - 5)$

$x = 0$ or $x - 5 = 0$

$x = 0$ or $x = 5$

The zeros are 0 and 5.

Check:

$(0)^2 - 5(0) \stackrel{?}{=} 0$

$0 - 0 \stackrel{?}{=} 0$

$0 = 0$

$(5)^2 - 5(5) \stackrel{?}{=} 0$

$25 - 25 \stackrel{?}{=} 0$

$0 = 0$

12. $f(x) = 3x^2 + 6x$

13. $f(x) = x^2 + 11x + 30$

14. $f(x) = x^2 - 9x - 36$

LESSON 13.5 Skills Practice

Name _____ Date _____

What Makes You So Special? Special Products

Vocabulary

Give an example of each term. Then, factor the expression.

1. perfect square trinomial

$$a^2 + 2ab + b^2 = (a+b)^2$$

$$x^2 + 8x + 16 = (\quad)^2$$

\uparrow root = x \uparrow 2(4)(x) roots \uparrow root = 4

or $a^2 - 2ab + b^2 = (a-b)^2$

or $x^2 - 8x + 16 = (\quad)^2$

\uparrow root \uparrow 2(both) \uparrow root

2. difference of two squares

$$a^2 - b^2 = (a+b)(a-b)$$

$$9x^2 - 1 = (\quad)(\quad)$$

\uparrow root = 3x \uparrow root = 1

3. sum of two cubes

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$x^3 + 8 = (\quad)(\quad)$$

cubed \uparrow root = x cube \uparrow root = 2

$$(\text{root} + \text{root}) (\text{root}^2 - \text{both roots} + \text{root}^2)$$

\uparrow same sign \uparrow opp sign \uparrow plus sign

4. difference of two cubes

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$x^3 - 8 = (\quad)(\quad)$$

$$(\text{root} - \text{root}) (\text{root}^2 + \text{both roots} + \text{root}^2)$$

\uparrow same sign \uparrow opp sign \uparrow plus sign

Problem Set

Factor each binomial completely.

1. $x^2 - 25$

$$x^2 - 25 = (x+5)(x-5)$$

2. $x^3 - 64$

3. $x^3 + 27$

4. $m^2 - 100$

5. $5x^3 + 40$

6. $t^3 - 125$

7. $8a^3 - 27$

8. $x^8 - y^8$

Determine the root(s) of each quadratic equation. Check your answer(s).

15. $x^2 - 100 = 0$

$$x^2 - 100 = 0$$

$$(x + 10)(x - 10) = 0$$

$$x + 10 = 0 \quad \text{or} \quad x - 10 = 0$$

$$x = -10 \quad \text{or} \quad x = 10$$

The roots are -10 and 10 .

Check:

$(-10)^2 - 100 \stackrel{?}{=} 0$	$(10)^2 - 100 \stackrel{?}{=} 0$
$100 - 100 \stackrel{?}{=} 0$	$100 - 100 \stackrel{?}{=} 0$
$0 = 0$	$0 = 0$

16. $m^2 - 16m + 64 = 0$

13

17. $6x^2 + 24x + 24 = 0$

18. $4x^2 - 9 = 0$