

(12.1) Quadratic Equations with Perfect Squares

$$\textcircled{1} \quad x^2 = 64$$
$$x = \pm 8$$

$$\textcircled{2} \quad 5x^2 = 125$$
$$x^2 = 25$$
$$x = \pm 5$$

$$\textcircled{3} \quad x^2 = -49$$

No Real Solution

$$\textcircled{4} \quad x^2 = 10$$
$$x = \pm \sqrt{10}$$

$$\textcircled{5} \quad x^2 = 12$$
$$x = \pm \sqrt{12} \leftarrow \text{simplify}$$
$$x = \pm 2\sqrt{3}$$

$$\textcircled{6} \quad x^2 = \frac{49}{100}$$
$$x = \pm \frac{7}{10}$$

$$\textcircled{7} \quad (x-1)^2 = 16$$
$$x-1 = \pm 4$$
$$x = 1 \pm 4$$

$$\boxed{5 \quad ; \quad -3}$$

$$\textcircled{8} \quad 5(x-3)^2 = 80$$
$$(x-3)^2 = 16$$
$$x-3 = \pm 4$$
$$x = 3 \pm 4$$

$$\boxed{7 \quad ; \quad -1}$$

$$\textcircled{9} \quad (2x+9)^2 = 225$$
$$2x+9 = \pm 15$$
$$\frac{2x}{2} = \frac{(-9 \pm 15)}{2}$$

$$\frac{(-9+15)}{2} \quad \frac{(-9-15)}{2}$$

$$\boxed{3 \quad ; \quad -12}$$

$$\textcircled{10} \quad x^2 - 4x + 4 = 16$$
$$(x-2)^2 = 16$$

$$x-2 = \pm 4$$
$$x = 2 \pm 4$$

$$\boxed{6 \quad ; \quad -2}$$

$$\textcircled{11} \quad (x-5)^2 = 7$$
$$x-5 = \pm \sqrt{7}$$
$$\boxed{x = 5 \pm \sqrt{7}}$$

Write as a square binomial.

$$\textcircled{12} \quad x^2 - 12x + 36$$

NAME _____

DATE _____

Practice 1

FOR USE WITH LESSON 12.1

In Exercises 1–6, express each trinomial as the square of a binomial. *perfect square*

1. $x^2 + 4x + 4$

$$(x+2)(x+2)$$
$$(x+2)^2$$

2. $a^2 - 8a + 16$

$$(a-4)^2$$

3. $p^2 - 12p + 36$

4. $t^2 + 18t + 81$

5. $h^2 - 6h + 9$

6. $m^2 - 10m + 25$

In Exercises 7–30, solve each equation. Express irrational solutions in simplest radical form.

7. $u^2 = 25$

8. $c^2 = 49$

9. $w^2 - 100 = 0$

10. $36 - r^2 = 0$

11. $5q^2 = 20$

12. $3d^2 = 192$

13. $9s^2 = 25$

14. $\frac{1}{2}k^2 = 2$

15. $b^2 + 3 = 19$

16. $n^2 + 15 = 16$

17. $y^2 - 7 = 2$

18. $16z^2 - 5 = 20$

19. $(x + 4)^2 = 25$

20. $(p - 3)^2 = 10$

21. $(h + 7)^2 = 24$

22. $v^2 = 7$

23. $t^2 = 40$

24. $f^2 = 207$

25. $3a^2 = 18$

26. $m^2 - 8 = 14$

27. $2q^2 + 9 = 13$

28. $\frac{1}{2}r^2 - 7 = 12$

29. $5w^2 - 13 = 47$

30. $10c^2 - 2 = 1$