

Algebra 1      8.9



Factor perfect square trinomials

{ Solve equations involving perfect squares

{ Solve equations using square root property (SRP)

perfect square

zero product property

prime

square root property

whiteboards

speed dating and/or eggcellent factoring



45.

$$A = 0.25d^2$$

↑                          ↑  
area                          distance

$$\frac{100}{0.25} = \frac{0.25d^2}{0.25} \quad \pm 20 = d$$
$$\sqrt{400} = \sqrt{d^2} \quad d = 20 \text{ ft}$$

$$47. \quad 16x^2 + 40x + 25$$

$$(4x + 5)^2$$

$$29. \quad \underbrace{\frac{2a^2b^2}{2a^2} - \frac{2a^2}{2a^2} - \frac{2ab^3}{-2ab} + \frac{2ab}{-2ab}}$$

$$2a^2(b^2 - 1) - 2ab(b^2 - 1)$$

$$\frac{(b^2 - 1)(2a^2 - 2ab)}{(b+1)(b-1)(2a)(a-b)}$$

$$37. \quad x^2 - \frac{3}{2}x + \frac{9}{16} = 0$$
$$\left(x - \frac{3}{4}\right)^2 = 0$$

$$\left(x - \frac{3}{4}\right)\left(x - \frac{3}{4}\right) = 0$$

$$\downarrow$$
$$x - \frac{3}{4} = 0$$

$$x = \frac{3}{4}$$

$$9. \quad 64y^2 - 48y + 18 = 9$$

SRP  
+  
-

$$64y^2 - 48y + 9 = 0$$

$$(8y - 3)^2 = 0$$

$$(8y - 3)(8y - 3) = 0$$

$$8y - 3 = 0$$

$$8y = 3$$

$$y = \frac{3}{8}$$

$$10. \quad (z + 5)^2 = 36$$

$$z + 5 = \pm 6$$

$$\begin{array}{r} -5 \\ -5 \end{array}$$

$$z = -5 \pm 6$$

$$z = \begin{array}{l} -5 + 6 = 1 \\ -5 + 6 = -1 \end{array}$$

What if it isn't a perfect square?

**Examples 3–4** Solve each equation.

7.  $4x^2 = 36$

8.  $25a^2 - 40a = -16$

Possible shortcut: Can you write it as a perfect square?

Examples 3-4 Solve each equation.

34.  $4m^2 - 24m + 36 = 0$

$$\sqrt{(2m - 6)^2} = \sqrt{0}$$

$$\begin{array}{r} 2m - 6 = \pm 0 \\ +6 \quad +6 \end{array}$$

$$\begin{array}{r} 2m - 6 \\ 2m + 6 \\ \hline -12m + 36 \end{array}$$

$$\begin{array}{r} 2m = 6 \\ \frac{2}{2} \quad \frac{6}{2} \\ m = 3 \end{array}$$

35.  $(y - 4)^2 = 7$

$$\begin{array}{r} y - 4 = \pm 5 \\ +4 \quad +4 \end{array}$$

$$\begin{array}{r} y = 4 \pm 5 = 4 + 5 = 9 \\ \quad \quad \quad = 4 - 5 = -1 \end{array}$$

What if it isn't a perfect square?

$$38. x^2 + 8x + 16 = 25$$

$$39. 5x^2 - 60x = -180$$

$$\sqrt{(x+4)^2} = \sqrt{25}$$

$$\begin{array}{r} x+4 \\ x+4 \\ \hline \end{array} \quad \begin{array}{r} x+4 = \pm 5 \\ -4 \quad -4 \\ \hline x = -4 \pm 5 = -4 + 5 = 1 \\ \phantom{x} = -4 - 5 = -9 \end{array}$$



Speed dating

$$x^2 + 10x + 25 = 3$$
$$\sqrt{(x+5)^2} = \sqrt{3}$$

$$x^2 + 14x + 49 = 13$$
$$\sqrt{(x+7)^2} = \sqrt{13}$$

$$x+7 = \pm 3.6$$
$$\begin{array}{r} x+7 \\ -7 \\ \hline x = -7 \pm 3.6 \end{array}$$

$$x+5 = \pm 1.7$$
$$\begin{array}{r} x+5 \\ -5 \\ \hline \end{array}$$

$$x = -5 \pm 1.7$$

$$\begin{array}{l} -5 + 1.7 = -3.3 \\ -5 - 1.7 = -6.7 \\ -7 - 3.6 = -10.6 \\ -7 + 3.6 = -3.4 \end{array}$$

$$8x^2 + 10x - 21$$

$$\begin{array}{r} -168 \\ \hline 1 \ 168 \\ 2 \ 84 \\ 3 \ 56 \\ 4 \ 42 \\ 6 \ 28 \\ 8 \ 21 \end{array}$$