

Solve by factoring.

a.  $81x^2 - 25 = 0$

$(9x+5)(9x-5) = 0$

$$\begin{array}{r} 9x+5=0 \\ -5 \quad -5 \\ \hline \end{array}$$

$$\frac{9x}{9} = \frac{-5}{9}$$

$$x = -\frac{5}{9}$$

$$\begin{array}{r} 9x-5=0 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\frac{9x}{9} = \frac{5}{9}$$

$$x = \frac{5}{9}$$

$$x = \pm \frac{5}{9}$$

b.  $3x^2 - 21x = 0$

$3x(x-7) = 0$

$$\frac{3x}{3} = \frac{0}{3}$$

$$x = 0$$

$$\begin{array}{r} x-7=0 \\ +7 \quad +7 \\ \hline \end{array}$$

$$x = 7$$

c.  $49z^2 + 112z = -64$

$$\begin{array}{r} +64 \\ +64 \end{array}$$

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 $49z^2 + 112z + 64 = 0$

$(7z+8)^2 = 0$

$7z+8=0$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array}$$

$$\frac{7z}{7} = \frac{-8}{7}$$

$$z = -\frac{8}{7}$$

## Sec. 1.5 Solve Quadratic Equations by Finding Square Roots

Solve

$$a. \quad 2x^2 - 15 = 65$$

$$\quad \quad \quad \frac{\quad + 15 \quad + 15}{\quad}$$

$$\frac{2x^2}{2} = \frac{80}{2}$$

$$x^2 = 40$$

$$\sqrt{x^2} = \pm \sqrt{40} < \begin{matrix} 4 < \textcircled{2} \\ 10 < \textcircled{3} \\ \textcircled{5} \end{matrix}$$

$$x = \pm 2\sqrt{10}$$

$$* x^2 = 25$$

$$x = 5, -5$$

$$b. \quad \frac{5x^2}{5} = \frac{80}{5}$$

$$x^2 = 16$$

$$x = \pm 4$$

$$c. \quad 3 \cdot \frac{1}{3} (x-4)^2 = 11 \cdot 3$$

$$(x-4)^2 = 33$$

$$\sqrt{(x-4)^2} = \pm \sqrt{33}$$

$$x-4 = \pm \sqrt{33}$$

$$\quad \quad \quad \frac{\quad + 4 \quad + 4}{\quad}$$

$$x = 4 \pm \sqrt{33}$$

$$d. \quad \frac{3(x-2)^2}{3} = \frac{40}{3}$$

$$(x-2)^2 = \frac{40}{3}$$

$$\sqrt{(x-2)^2} = \pm \sqrt{\frac{40}{3}} \quad \begin{matrix} \textcircled{2} \\ \swarrow 20 \end{matrix} \quad \begin{matrix} \textcircled{2} \\ \swarrow 10 \end{matrix} \quad \begin{matrix} \textcircled{2} \\ \swarrow 3 \end{matrix}$$

$$x-2 = \pm \frac{2\sqrt{10}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$x-2 = \pm \frac{2\sqrt{30}}{3}$$

$$\begin{array}{r} +2 \quad +2 \\ \hline x = 2 \pm \frac{2\sqrt{30}}{3} \end{array}$$

## Sec. 1.6 Performing Operations with Complex Numbers

Solve

$$a. \quad \begin{array}{r} 2x^2 + 18 = -72 \\ -18 \quad -18 \\ \hline \end{array}$$

$$\frac{2x^2}{2} = \frac{-90}{2}$$

$$x^2 = -45$$

$$\sqrt{x^2} = \pm\sqrt{-45} \left( \begin{array}{l} 5 \\ 9 \end{array} \right)$$

$$x = \pm 3i\sqrt{5}$$

$$b. \quad \begin{array}{r} 3x^2 - 7 = -31 \\ +7 \quad +7 \\ \hline \end{array}$$

$$\frac{3x^2}{3} = \frac{-24}{3}$$

$$x^2 = -8$$

$$\sqrt{x^2} = \pm\sqrt{-8}$$

$$x = \pm 2i\sqrt{2}$$

p. 36 (23-31) odd

p. 45 (3-11) odd

p. 29 # 49,

$$g(x) = 12x^2 + 5x - 7$$

$$g(x) = 12x^2 - 7x + 12x - 7$$

$$= x(12x - 7) + 1(12x - 7)$$

$$g(x) = (x+1)(12x-7)$$

$$0 = x+1 \quad 0 = 12x-7$$

$$x = -1 \quad x = \frac{7}{12}$$

$$12 \cdot 7 = \underline{84}$$

$$1 \cdot 84$$

$$2 \cdot 42$$

$$3 \cdot 28$$

$$4 \cdot 21$$

$$6 \cdot 14$$

$$\boxed{-7 \cdot 12}$$

$$\# 58. (x+8)^2 = 16 - x^2 + 9x$$

$$(x+8)(x+8)$$

$$x^2 + 8x + 8x + 64$$

$$x^2 + 16x + 64 = 16 - x^2 + 9x$$

$$+ x^2 - 9x - 16 \quad -16 + x^2 - 9x$$

$$2x^2 + \underline{7x} + 48 = 0$$

$$\underline{96}$$

$$1 \cdot 96$$

$$2 \cdot 48$$

$$3 \cdot 32$$

$$4 \cdot 24$$

$$6 \cdot 16$$

$$8 \cdot 12$$

~~no~~

not factorable