

Use substitution to solve:

$$y = x^2 - 2$$

$$y = 3x^2 - 4x - 2$$

$$\begin{array}{r} x^2 - 2 = 3x^2 - 4x - 2 \\ -x^2 + 2 \quad -x^2 \quad \quad + 2 \\ \hline 0 = 2x^2 - 4x \end{array}$$

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

$$0 = 2x(x - 2)$$

$$\frac{2x}{2} = \frac{0}{2} \\ x = 0$$

$$\begin{array}{r} x - 2 = 0 \\ + 2 \quad + 2 \\ \hline x = 2 \end{array}$$

$$y = x^2 - 2$$

$$y = 0^2 - 2 \\ y = -2$$

$$(0, -2)$$

$$y = 2^2 - 2$$

$$y = 4 - 2 \\ y = 2$$

$$(2, 2)$$

$$y = -x^2 + x + 4$$

$$y = 2x^2 - 6$$

$$\begin{array}{r} -x^2 + x + 4 = 2x^2 - 6 \\ -2x^2 \quad + 6 \quad -2x^2 + 6 \\ \hline -3x^2 + x + 10 = 0 \end{array}$$

$$\frac{-3x^2}{-1} + \frac{x}{-1} + \frac{10}{-1} = \frac{0}{-1}$$

$$3x^2 - x - 10 = 0$$

$$3x^2 - 6x + 5x - 10 = 0$$

$$3x(x - 2) + 5(x - 2) = 0$$

$$(x - 2)(3x + 5) = 0$$

$$\begin{array}{r} x - 2 = 0 \\ + 2 \quad + 2 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} 3x + 5 = 0 \\ -5 \quad -5 \\ \hline 3x = -5 \\ \frac{3x}{3} = \frac{-5}{3} \end{array}$$

$$y = 2x^2 - 6$$

$$x = -\frac{5}{3}$$

$$y = 2(2)^2 - 6$$

$$y = 2\left(-\frac{5}{3}\right)^2 - 6$$

$$y = 2 \cdot 4 - 6$$

$$y = 2\left(\frac{25}{9}\right) - 6$$

$$y = 8 - 6$$

$$y = \frac{50}{9} - \frac{54}{9}$$

$$y = 2$$

$$y = -\frac{4}{9}$$

$$(2, 2)$$

$$\left(-\frac{5}{3}, -\frac{4}{9}\right)$$

4.7

Practice:

$$2x(x-1) = 3$$

$$2x^2 - 2x = 3$$

$$\frac{2x^2 - 2x - 3}{-3 \quad -3} = 0$$

$$a=2 \quad b=-2 \quad c=-3$$

$$\frac{2 \pm \sqrt{10}}{4}$$

$$\frac{2}{4} \pm \frac{\sqrt{10}}{4}$$

Q.F.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{2 \pm \sqrt{4 + 24}}{2 \cdot 2}$$

$$x = \frac{2 \pm \sqrt{28}}{4}$$

$$x = \frac{2 \pm 2\sqrt{7}}{4} = \frac{2(1 \pm \sqrt{7})}{2 \cdot 2}$$

$$x = \frac{1 \pm \sqrt{7}}{2}$$

Sec. 8.4 Rational Expressions

Write in simplest form: FACTOR & CANCEL

$$a. \frac{9x^2 + 6x}{36x + 24} = \frac{3x \cancel{(3x+2)}}{12 \cancel{(3x+2)} \neq 0} = \frac{x}{4}, x \neq -\frac{2}{3}$$

$\begin{matrix} -2 & -2 \\ \hline 3x = -\frac{2}{3} \end{matrix}$

$$b. \frac{x^2 - 3x + 2}{x + 2} \cdot \frac{x^2 - 36}{x^2 + 5x - 6}$$

$$\frac{\cancel{(x-1)}(x-2)}{(x+2)} \cdot \frac{\cancel{(x+6)}(x-6)}{\cancel{(x+6)}(x-1)}$$

$$\frac{(x-2)(x-6)}{(x+2)}, x \neq -2, -6, 1$$