

Section 1.6

24) $7x^3 - x + 1 = x^3 + 3x^2 + x$

$$6x^3 - 3x^2 - 2x + 1 = 0$$

$$3x^2(2x-1) - (2x-1) = 0$$

$$(2x-1)(3x^2-1) = 0$$

$$2x-1=0 \text{ OR } 3x^2-1=0$$

$$x = \frac{1}{2}$$

$$x^2 = \frac{1}{3}$$

$$|x| = \sqrt{\frac{1}{3}}$$

$$x = \frac{1}{\sqrt{3}} \text{ OR } x = -\frac{1}{\sqrt{3}}$$

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$$\frac{x}{x+3} = \frac{2}{x-3} - \frac{1}{x^2-9}$$

$$\frac{x}{x+3} = \frac{2}{x-3} - \frac{1}{(x-3)(x+3)} \quad \text{LCD } (x-3)(x+3)$$

$$(x-3)(x+3) \frac{x}{x+3} = \left[\frac{2}{x-3} - \frac{1}{(x-3)(x+3)} \right] (x-3)(x+3)$$

$$x(x-3) = \frac{2}{x-3} (x-3)(x+3) - \frac{1}{(x-3)(x+3)} (x-3)(x+3)$$

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

$$x^2 - 3x = 2x + 5$$

$$-2x - 5 \quad -2x - 5$$

$$x^2 - 5x - 5 = 0$$

$$x = \frac{5 \pm \sqrt{25+20}}{2}$$

$$x = \frac{5 \pm \sqrt{45}}{2}$$

$$x = \frac{5 \pm 3\sqrt{5}}{2}$$

$$x = \frac{5+3\sqrt{5}}{2} \text{ OR } x = \frac{5-3\sqrt{5}}{2}$$

44) $x - \sqrt{9-3x} = 0$

$$x = \sqrt{9-3x}$$

$$x^2 = (\sqrt{9-3x})^2$$

$$x^2 = 9-3x$$

$$x^2 + 3x - 9 = 0$$

$$x = \frac{-3 \pm \sqrt{9+36}}{2}$$

$$x = \frac{-3 + \sqrt{45}}{2}$$

$$\text{OR } x = \frac{-3 - \sqrt{45}}{2}$$

not a solution
because $x < 0$
cannot satisfy

$$x = \sqrt{9-3x} \geq 0$$

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$$x^4 - 5x^2 + 6 = 0$$

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

$$(x^2-3)(x^2-2) = 0$$

$$x^2-3=0 \text{ OR } x^2-2=0$$

$$x^2=3 \text{ OR } x^2=2$$

$$x = \sqrt{3}, -\sqrt{3}, \sqrt{2}, \text{ OR } -\sqrt{2}$$