

$$69. \quad 2x^3 - 6x^2 = 0$$

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

$$2x^2 = 0 \quad x-3 = 0$$

$$x = 0, 0 \quad x = 3$$

$$x = 0, 0, 3$$

$$71. \quad x^3 + 27 = 0$$

$$a=x \quad (x+3)(x^2 - 3x + 9) = 0$$

$$b=3 \quad x+3=0 \quad x = \frac{3 \pm \sqrt{(-3)^2 - 4(1)(9)}}{2(1)}$$

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

$$x = -3 \quad x = \frac{3 \pm \sqrt{-27}}{2}$$

$$73. \quad x^4 + 7x^3 - 8x - 56 = 0$$

$$x^3(x+7) - 8(x+7) = 0$$

$$a=x \quad (x^3 - 8)(x+7) = 0$$

$$b=2 \quad \Rightarrow (x-2)(x^2 + 2x + 4) \rightarrow x^2 + 2x + 1 = -4 + 1$$

$$x = -7, 2 \quad \text{CTS} \quad (x+1)^2 = -3$$

$$x = -1 \pm i\sqrt{3}$$

$$x = -7, 2, -1 \pm i\sqrt{3}$$

$$75. \quad 3x^7 - 243x^3 = 0$$

$$3x^3(x^4 - 81) = 0$$

$$3x^3(x^2 - 9)(x^2 + 9)$$

$$3x^3(x+3)(x-3)(x+3i)(x-3i) = 0$$

$$x = 0, 0, 0, \pm 3, \pm 3i$$

$$77. \quad 8x^3 - 1 = 0$$

$$x = \frac{1}{2}, -\frac{1}{4} \pm \frac{i\sqrt{3}}{4}$$

$$a=2x \quad (2x-1)(4x^2+2x+1)$$

$$b=1 \quad 2x-1=0 \quad x = \frac{-2 \pm \sqrt{(2)^2 - 4(4)(1)}}{2(4)}$$

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

$$x = \frac{-2 \pm \sqrt{-12}}{8} = \frac{-2}{8} \pm \frac{2i\sqrt{3}}{8}$$

$$79. \quad x^3 - 5x^2 + 5x - 25 = 0$$

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

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

$$x^2+5=0 \quad x-5=0$$

$$x^2 = -5 \quad x = 5$$

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

$$81. \quad x^4 + x^3 - x - 1 = 0$$

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

$$a=x \quad (x^3-1)(x+1) = 0$$

$$b=1 \quad (x-1)(x^2+x+1)(x+1)$$

$$x-1=0 \quad x = \frac{-1 \pm \sqrt{1-4(1)(1)}}{2}$$

$$x+1=0$$

$$x = \frac{-1 \pm \sqrt{-3}}{2} = \frac{-1}{2} \pm \frac{i\sqrt{3}}{2}$$

$$x = 1, -1, \frac{-1}{2} \pm \frac{i\sqrt{3}}{2}$$

83.

$$-2x^6 = 16$$

$$0 = 2x^6 + 16$$

$$2(x^6 + 8) = 0$$

$$a = x^2$$

$$b = 2$$

SOAP problem

$$\sqrt[3]{x^6} = x^2$$

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

$$x^2 + 2 = 0$$

$$x^2 = -2$$

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

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

85.

$$2x^5 - 12x^3 + 16x = 0$$

$$2x(x^4 - 6x^2 + 8) = 0$$

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

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

$$x = 0, \pm\sqrt{2}, \pm 2$$