

$$65. \quad p/60$$

$$16t^2 - 4t + 3 = 0$$

$$t = \frac{4 \pm \sqrt{(-4)^2 - 4(16)(3)}}{2(16)}$$

$$t = \frac{4 \pm \sqrt{16 - 192}}{32}$$

$$t = \frac{4 \pm \sqrt{-176}}{32}$$

$$t = \frac{4 \pm 4i\sqrt{11}}{32}$$

$$t = \frac{1 \pm i\sqrt{11}}{8}$$

$$69. \quad x^2 + 3x - 5 = 0$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(1)(-5)}}{2(1)}$$

$$x = \frac{-3 \pm \sqrt{29}}{2}$$

$$\left(\frac{-3 + \sqrt{29}}{2}, 0 \right) \left(\frac{-3 - \sqrt{29}}{2}, 0 \right)$$

4. p. 159

$$(\sqrt{5} - \sqrt{3}i)(\sqrt{5} + \sqrt{3}i)$$

$$\sqrt{25} + \sqrt{15}i - \sqrt{15}i - \sqrt{9}i^2$$

5

- 3(-1)

5 + 3

8

$$5. (a+3) + (b-1)i$$

$$7 - 4i$$

$$\begin{aligned} a+3 &= 7 \\ a &= 4 \end{aligned}$$

$$\begin{aligned} b-1 &= -4 \\ b &= -3 \end{aligned}$$



$$\begin{aligned} 29 \quad & \sqrt{-3} \cdot \sqrt{-8} \\ & i\sqrt{3} \cdot 2i\sqrt{2} \\ & 2i^2\sqrt{6} \\ & -2\sqrt{6} \end{aligned}$$

2.6

$$x^2 + 36 = 0$$

2. $\sqrt{x^2} = \sqrt{-36}$

p/167 $x = \pm 6i$

$$\sqrt{36 \cdot -1}$$

$$\sqrt{36} \cdot \sqrt{-1}$$

$$6i$$

8.

$$g(x) = x^3 + 7x$$

$$x^3 + 7x = 0$$

$$x(x^2 + 7) = 0$$

$$x = 0 \quad x^2 + 7 = 0$$

$$\sqrt{x^2} = \sqrt{-7}$$

$$x = 0 \quad x = \pm i\sqrt{7}$$

$$f(x) = x^4 + 10x^2 + 9$$

$$y = x^4 + 10x^2 + 9$$

$$0 = x^4 + 10x^2 + 9$$

$$0 = (x^2 + 9)(x^2 + 1)$$

$$x^2 + 9 = 0 \quad x^2 + 1 = 0$$

$$\sqrt{x^2} = \sqrt{-9}$$

$$x = \pm 3i$$

$$\sqrt{x^2} = \sqrt{-1}$$

$$x = \pm i$$

$$-3, 6i, -6i$$

$$x = -3 \quad x = \pm 6i$$

$$x = -3 \quad x^2 = -36$$

$$(x + 3)(x^2 + 36)$$

$$x^3 + 3x^2 + 36x + 108 = 0$$

41.

$$f(x) = x^4 - 4x^3 + 5x^2 - 2x - 6$$

$$\begin{array}{r}
 x^2 - 2x + 3 \\
 \hline
 x^2 - 2x - 2 \left[\begin{array}{r} x^4 - 4x^3 + 5x^2 - 2x - 6 \\ - x^4 - 2x^3 - 2x^2 \\ \hline - 2x^3 + 7x^2 - 2x - 6 \\ - -2x^3 + 4x^2 + 4x \\ \hline 3x^2 - 6x - 6 \\ - 3x^2 - 6x - 6 \\ \hline 0 \end{array} \right.
 \end{array}$$

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

Rational

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

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

$$x = \frac{2 \pm \sqrt{12}}{2}$$

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

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

$$x = \frac{2 \pm \sqrt{(2)^2 - 4(1)(3)}}{2(1)}$$

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

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

$$x = 1 \pm i\sqrt{2}$$

$$x = 1 + i\sqrt{2} \quad x = 1 - i\sqrt{2}$$

Reals

$$x = 1 + \sqrt{3} \quad x = 1 - \sqrt{3}$$

$$(x - 1 - \sqrt{3})(x - 1 + \sqrt{3})(x^2 - 2x + 3) = 0$$

*Complexity
Technical*

$$(x - 1 - \sqrt{3})(x - 1 + \sqrt{3})(x - 1 - i\sqrt{2})(x - 1 + i\sqrt{2}) = 0$$

$$45. \quad 6i \quad -6i$$

$$\begin{array}{l|ccccc}
 6i & 1 & -2 & 37 & -72 & 36 \\
 & & 6i & -12i+36i^2 & 6i-72i^2 & 36i^2 \\
 \hline
 -6i & 1 & -2+6i & 1-12i & 6i & 0 \\
 & & -6i & 12i & -6i & \\
 \hline
 & 1 & -2 & 1 & 0 &
 \end{array}$$

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

$$(x-1)(x-1) = 0$$

$$\begin{array}{l}
 x-1=0 \quad x-1=0 \\
 x=1 \text{ or } \quad x=\pm 6i
 \end{array}$$