

$$1. \frac{\sqrt{48}}{\sqrt{16} \sqrt{3}} = \frac{4\sqrt{3}}{4\sqrt{3}}$$

$$2. \frac{\sqrt{9} \cdot 3\sqrt{27}}{3 \cdot 3\sqrt{27}} = \frac{9\sqrt{27}}{9\sqrt{27}} = \frac{\sqrt{9} \sqrt{3}}{27\sqrt{3}}$$

$$3. \frac{\sqrt{4}}{\sqrt{5}} \cdot \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{12}}{\sqrt{25}} = \frac{\sqrt{12}}{5} \cdot \frac{\sqrt{4}}{\sqrt{4}} = \frac{2\sqrt{3}}{5}$$

$$4. \frac{1}{(3+\sqrt{3})(3-\sqrt{3})}$$

$$5. \frac{(1+\sqrt{5})(5-\sqrt{5})}{(5+\sqrt{5})(5-\sqrt{5})}$$

$$\frac{3-\sqrt{3}}{9-3\sqrt{3}+3\sqrt{3}-\sqrt{9}} = \frac{3-\sqrt{3}}{6} = \frac{5-\sqrt{5}+5\sqrt{5}-\sqrt{25}}{25-5\sqrt{5}+5\sqrt{5}-\sqrt{25}} = \frac{4\sqrt{5}}{20} = \frac{\sqrt{5}}{5}$$

$$6. \frac{2x^2}{2} = \frac{32}{2}$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

$$7. x^2 = 2x^2 + 4$$

$$-x^2 = 4$$

$$\sqrt{x^2} = \sqrt{-4}$$

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

$$x = \pm 2i$$

$$8. \frac{1}{2}x^2 + 8 = 17$$

$$\frac{1}{2}x^2 = 9$$

$$\sqrt{x^2} = \sqrt{18}$$

$$x = \pm \sqrt{18} = \pm 3\sqrt{2}$$

$$9. 20 - x^2 = -29$$

$$-x^2 = -49$$

$$\sqrt{x^2} = \sqrt{49}$$

$$x = \pm 7$$

$$10. \sqrt{(x-3)^2} = \sqrt{-12}$$

$$x-3 = \pm \sqrt{-12}$$

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

$$11. 4(x+2)^2 + 320 = 0$$

$$4(x+2)^2 = -320$$

$$\sqrt{(x+2)^2} = \sqrt{-80}$$

$$x+2 = \pm \sqrt{-80}$$

$$x = -2 \pm \sqrt{-80} = -2 \pm 4i\sqrt{5}$$

$$12. \begin{array}{l} (-4-i) + (4+5i) \\ (-4-i) + (-4-5i) \\ -8-6i \end{array} \quad 13. \begin{array}{l} (5-3i) + (-3-6i) \\ 2-9i \end{array}$$

$$14. \begin{array}{l} -2i(1+i)(2-3i) \\ -2i[2-3i+2i-3i^2] \\ -2i[2-i+3] \\ -2i[5-i] \\ -10i+2i^2 \\ -10i-2 \\ -2-10i \end{array}$$

$$15. \begin{array}{l} (2-i)(3-4i) \\ (3+4i)(3-4i) \\ = \frac{6-8i-3i+4i^2}{9-12i+12i-16i^2} = \frac{6-11i-4}{9+16} \\ = \frac{2+11i}{25} = \frac{2}{25} + \frac{11i}{25} \end{array}$$

$$16. \frac{2(x^2-6x+9)}{2} = \frac{32}{2}$$

$$x^2-6x+9=16$$

$$\sqrt{(x-3)^2} = \sqrt{16}$$

$$x-3 = \pm 4$$

$$\begin{array}{l} +3 \quad +3 \\ \hline \end{array}$$

$$x = 3 \pm 4$$

$$x = 7, -1$$

$$17. x^2-12x+36 = -49$$

$$\sqrt{(x-6)^2} = \sqrt{-49}$$

$$x-6 = \pm 7i$$

$$\begin{array}{l} +6 \quad +6 \\ \hline \end{array}$$

$$x = 6 \pm 7i$$

$$19. x^2-22x+c$$

$$c = 121$$

$$(x-11)^2$$

$$18. x^2 + \frac{3}{2}x + \frac{9}{16} = 3$$

$$\sqrt{\left(x + \frac{3}{4}\right)^2} = \sqrt{3}$$

$$\left(x + \frac{3}{4}\right) = \pm \sqrt{3}$$

$$\begin{array}{l} -\frac{3}{4} \quad -\frac{3}{4} \\ \hline \end{array}$$

$$x = -\frac{3}{4} \pm \sqrt{3}$$

$$20. x^2+7x+c$$

$$c = \frac{49}{4}$$

$$\left(x + \frac{7}{2}\right)^2$$

$$21. x^2-3x-c$$

$$c = \frac{9}{4}$$

$$\left(x - \frac{3}{2}\right)^2$$

$$\begin{aligned}
 22. \quad x^2 + 4x &= 1 \\
 x^2 + 4x + 4 &= 1 + 4 \\
 \sqrt{(x+2)^2} &= \sqrt{5} \\
 x+2 &= \pm\sqrt{5} \\
 \frac{-2}{-2} & \\
 \hline
 x &= -2 \pm \sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 23. \quad x^2 - 2x - 9 &= 0 \\
 x^2 - 2x + 1 &= 9 + 1 \\
 \sqrt{(x-1)^2} &= \sqrt{10} \\
 x-1 &= \pm\sqrt{10} \\
 \frac{+1}{+1} & \\
 \hline
 x &= 1 \pm \sqrt{10}
 \end{aligned}$$

$$\begin{aligned}
 24. \quad x^2 + 8x + 4 &= 0 \\
 x^2 + 8x + 16 &= -4 + 16 \\
 \sqrt{(x+4)^2} &= \sqrt{12} \\
 x+4 &= \pm\sqrt{12} \\
 \frac{-4}{-4} & \\
 \hline
 x &= -4 \pm \sqrt{12} \quad \left\{ \begin{array}{l} \sqrt{4} \\ \sqrt{3} \end{array} \right. \\
 x &= -4 \pm 2\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 25. \quad x^2 - 3x + 2 &= 0 \\
 A=1 \quad x &= \frac{3 \pm \sqrt{9 - 4(1)(2)}}{2(1)} = \frac{3 \pm \sqrt{9-8}}{2} \\
 B=-3 \quad & \\
 C=2 \quad & \\
 &= \frac{3 \pm \sqrt{1}}{2} = \frac{3 \pm 1}{2} = \frac{4}{2}, \frac{2}{2} \\
 &= 2, 1
 \end{aligned}$$

$$\begin{aligned}
 26. \quad 3x^2 + x - 4 &= 0 \\
 A=3 \quad x &= \frac{-1 \pm \sqrt{1 - 4(3)(-4)}}{2(3)} = \frac{-1 \pm \sqrt{1+48}}{6} \\
 B=1 \quad & \\
 C=-4 \quad & \\
 &= \frac{-1 \pm \sqrt{49}}{6} = \frac{-1 \pm 7}{6} \\
 &= \frac{6}{6}, \frac{-8}{6} = 1, -\frac{4}{3}
 \end{aligned}$$

$$\begin{aligned}
 27. \quad -2x^2 - 2x - 1 &= 0 \\
 A=-2 \quad x &= \frac{2 \pm \sqrt{4 - 4(-2)(-1)}}{2(-2)} \\
 B=-2 \quad & \\
 C=-1 \quad & \\
 &= \frac{2 \pm \sqrt{4-8}}{-4} \\
 &= \frac{2 \pm \sqrt{-4}}{-4} = \frac{2 \pm 2i}{-4} = \frac{+1 \pm i}{-2}
 \end{aligned}$$

$$\begin{aligned}
 28. \quad -x^2 + 3x - 4 &= 2 \\
 A=-1 \quad -x^2 + 3x - 6 &= 0 \\
 B=3 \quad x &= \frac{-3 \pm \sqrt{9 - 4(-1)(-6)}}{2(-1)} \\
 C=-6 \quad & \\
 &= \frac{-3 \pm \sqrt{9-24}}{-2} = \frac{-3 \pm \sqrt{-15}}{-2} \\
 &= \frac{-3 \pm i\sqrt{15}}{-2}
 \end{aligned}$$

$$\begin{aligned}
 29. \quad 2x^2 - 1 &= 3x + 4 \\
 -3x - 4 \quad -3x - 4 & \\
 \hline
 2x^2 - 3x - 5 &= 0 \\
 A=2 \quad x &= \frac{3 \pm \sqrt{9 - 4(2)(-5)}}{2(2)} \\
 B=-3 \quad & \\
 C=-5 \quad & \\
 &= \frac{3 \pm \sqrt{9+40}}{4} = \frac{3 \pm \sqrt{49}}{4} \\
 &= \frac{3 \pm 7}{4} = \frac{10}{4}, \frac{-4}{4} = \frac{5}{2}, -1
 \end{aligned}$$

$$30. \frac{3x^2 + 2x}{-x^2 - x - 1} = \frac{x^2 + x + 1}{-x^2 - x - 1}$$

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

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

$$B: 1$$

$$C: -1 \quad = \frac{-1 \pm \sqrt{1+8}}{4}$$

$$= \frac{-1 \pm \sqrt{9}}{4} = \frac{1 \pm 3}{4} = \frac{4}{4}, \frac{-2}{4} = 1, -\frac{1}{2}$$

$$33. 5x^2 + 7x + 6 = 0$$

$$A: 5 \quad 49 - 4(5)(6)$$

$$B: 7 \quad 49 - 120 = -71$$

$$C: 6 \quad 2 \text{ imag sol.}$$

$$35. x(2x) = 40.5$$

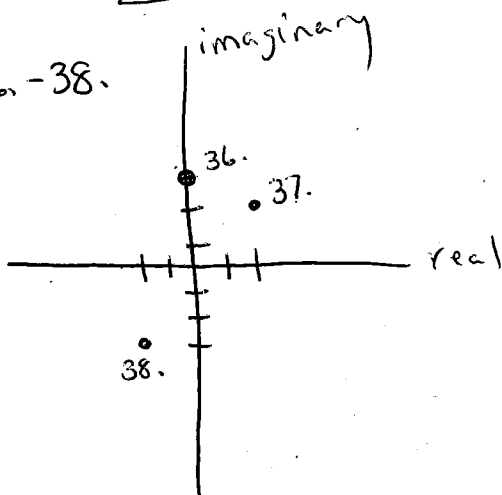
$$\frac{2x^2}{2} = \frac{40.5}{2}$$

$$\sqrt{x^2} = \sqrt{20.25}$$

$$x = \pm 4.5$$

$$\boxed{4.5}$$

36.-38.



$$31. b^2 - 4ac$$

$$A: 2 \quad 9 - 4(2)(1)$$

$$B: 3 \quad 9 - 8 = 1$$

$$C: 1 \quad 2 \text{ real sol.}$$

$$32. -x^2 - 4x - 6 = 0$$

$$A: -1 \quad 16 - 4(-1)(-6)$$

$$B: -4 \quad 16 - 24 = -8$$

$$C: -6 \quad 2 \text{ imag sol.}$$

$$34. x(x+2.3) = 17.6$$

$$x^2 + 2.3x = 17.6$$

$$x^2 + 2.3x + 1.3225 = 17.6 + 1.3225$$

$$\sqrt{(x+1.15)^2} = \sqrt{18.9225}$$

$$x+1.15 = \pm 4.35$$

$$-1.15 \quad -1.15$$

$$x = -1.14 \pm 4.35 = 3.21, -5.49$$

$$\boxed{3.21}$$

$$39. |3-4i| = \sqrt{3^2 + (-4)^2} = \sqrt{9+16} = \sqrt{25} = 5$$

$$40. |\sqrt{3} - i| = \sqrt{(\sqrt{3})^2 + (-1)^2} = \sqrt{3+1} = \sqrt{4} = 2$$

$$41. |-10i| = \sqrt{0^2 + (-10)^2} = \sqrt{0+100} = \sqrt{100} = 10$$

$$42. |\sqrt{2} - i\sqrt{6}| = \sqrt{(\sqrt{2})^2 + (\sqrt{6})^2}$$

$$= \sqrt{2+6} = \sqrt{8}$$

$$\sqrt{4} \sqrt{2}$$

$$= 2\sqrt{2}$$