

ANSWERS  $\rightarrow$  method 3 - QUADRATIC FORMULA

24.  $x^2 + 6x + 5 = 0$

$a = 1$ ;  $b = 6$ ;  $c = 5$

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

$$x = \frac{-6 \pm \sqrt{(6)^2 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{36 - 20}}{2}$$

$$x = \frac{-6 \pm \sqrt{16}}{2}$$

$$x = \frac{-6 \pm 4}{2}$$

$$x = \frac{-6 + 4}{2} \quad \text{and} \quad x = \frac{-6 - 4}{2}$$

$$x = \frac{-2}{2} \quad x = \frac{-10}{2}$$

$$x = -1 \quad x = -5$$

$$25. \quad x^2 + 4x + 4 = 0$$
$$a=1; \quad b=4; \quad c=4.$$

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

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

$$x = \frac{-4 \pm \sqrt{16 - 16}}{2}$$

$$x = \frac{-4 \pm \sqrt{0}}{2}$$

$$x = \frac{-4 \pm 0}{2}$$

$$x = \frac{-4}{2}$$

$$x = -2$$

$$26. \begin{cases} x^2 - 5x - 12 = 0 \\ a = 2; b = -5; c = -12. \end{cases}$$

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

$$x = \frac{5 \pm \sqrt{(-5)^2 - 4(2)(-12)}}{2(2)}$$

$$x = \frac{5 \pm \sqrt{25 + 96}}{4}$$

$$x = \frac{5 \pm \sqrt{121}}{4}$$

$$x = \frac{5 \pm 11}{4}$$

$$x = \frac{5+11}{4} \text{ and } x = \frac{5-11}{4}$$

$$x = \frac{16}{4} \qquad x = \frac{-6}{4}$$

$$x = 4 \qquad x = -\frac{3}{2}$$

$$27. \quad 4x^2 - 9 = 0$$

$$a = 4; \quad b = 0; \quad c = -9$$

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

$$x = \frac{0 \pm \sqrt{(0)^2 - 4(4)(-9)}}{2(4)}$$

$$x = \frac{0 \pm \sqrt{0 + 144}}{8}$$

$$x = \pm \frac{\sqrt{144}}{8}$$

$$x = \pm \frac{12}{8}$$

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

$$28. \quad 2x^2 - 5x = 0$$

$a=2; b=-5; c=0.$

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

$$x = \frac{5 \pm \sqrt{(-5)^2 - 4(2)(0)}}{2(2)}$$

$$x = \frac{5 \pm \sqrt{25 - 0}}{4}$$

$$x = \frac{5 \pm \sqrt{25}}{4}$$

$$x = \frac{5 \pm 5}{4}$$

$$x = \frac{5+5}{4} \quad \text{and} \quad x = \frac{5-5}{4}$$

$$x = \frac{10}{4}$$

$$x = \frac{0}{4}$$

$$x = \frac{5}{2}$$

$$x = 0$$

$$29. \quad 7x^2 - 2x - 2 = 0$$

$$a = 7; \quad b = -2; \quad c = -2$$

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

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(7)(-2)}}{2(7)}$$

$$x = \frac{2 \pm \sqrt{4 + 56}}{14}$$

$$x = \frac{2 \pm \sqrt{60}}{14}$$

$$x = \frac{2 \pm \sqrt{4 \times 15}}{14}$$

$$x = \frac{2 \pm 2\sqrt{15}}{14}$$

$$x = \frac{1 \pm \sqrt{15}}{7}$$

$$30. \quad 4x = 5 - 4x^2$$

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

$$a = 4; b = 4; c = -5$$

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

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

$$x = \frac{-4 \pm \sqrt{16 + 80}}{8}$$

$$x = \frac{-4 \pm \sqrt{96}}{8}$$

$$x = \frac{-4 \pm \sqrt{16 \times 6}}{8}$$

$$x = \frac{-4 \pm 4\sqrt{6}}{8}$$

$$x = \frac{-1 \pm 1\sqrt{6}}{2}$$

$$31 \quad x^2 + 5x + 8 = 0$$

$$a=1; b=5; c=8$$

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

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4(1)(8)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{25 - 32}}{2}$$

$$x = \frac{-5 \pm \sqrt{-7}}{2} \quad \text{since } j^2 = -1$$

$$x = \frac{-5 \pm \sqrt{7}j^2}{2}$$

$$x = \frac{-5 \pm j\sqrt{7}}{2}$$



$$32. x^2 - x + 7 = 0$$

$$a=1; b=-1; c=7$$

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

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

$$x = \frac{1 \pm \sqrt{1 - 28}}{2}$$

$$x = \frac{1 \pm \sqrt{-27}}{2} \quad \text{since } i^2 = -1$$

$$x = \frac{1 \pm \sqrt{27i^2}}{2}$$

$$x = \frac{1 \pm i\sqrt{9 \times 3}}{2}$$

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

$$33. 2x^2 + 3x + 3 = 0$$

$$a = 2; b = 3; c = 3$$

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

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

$$= \frac{-3 \pm \sqrt{9 - 24}}{4}$$

$$= \frac{-3 \pm \sqrt{-15}}{4}$$

Since  $i^2 = -1$

$$= \frac{-3 \pm \sqrt{15}i^2}{4}$$

$$= \frac{-3 \pm i\sqrt{15}}{4}$$

$$34. \quad 5x^2 + 5x + 2 = 0$$

$$a = 5; \quad b = 5; \quad c = 2$$

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

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

$$x = \frac{-5 \pm \sqrt{25 - 40}}{10}$$

$$= \frac{-5 \pm \sqrt{-15}}{10}$$

$$= \frac{-5 \pm \sqrt{15}j^2}{10}$$

$$= \frac{-5 \pm j\sqrt{15}}{10}$$