

key

Solve each quadratic equation using the best method:

1. $5x^2 + 18x + 9 = 0$

$$(5x+3)(x+3) = 0$$

$$5x+3=0 \quad | \quad x+3=0$$

$$5x=-3 \quad | \quad x=-3$$

$$x = -\frac{3}{5}$$

$$x = -3, -\frac{3}{5}$$

4. $\frac{1}{7}x^2 - 3 = 4$

$$\frac{1}{2}x^2 = 7$$

$$x^2 = 49$$

$$x = \pm 7$$

2. $x^2 - 20 = 8x$

$$x^2 - 8x - 20 = 0$$

$$(x-10)(x+2) = 0$$

$$x-10=0 \quad | \quad x+2=0$$

$$x=10 \quad | \quad x=-2$$

$$x = 10, -2$$

5. $5(x-4)^2 = 125$

$$(x-4)^2 = 25$$

$$x-4 = \pm 5$$

$$x = 4 \pm 5$$

$$x = 9, -1$$

3. $2x^2 + 5x - 3 = 0$

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

$$2x-1=0 \quad | \quad x+3=0$$

$$2x=1 \quad | \quad x=-3$$

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

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

6. $2(x-5)^2 + 2 = -30$

$$2(x-5)^2 = -32$$

$$(x-5)^2 = -16$$

$$x-5 = \pm 4i$$

$$x = 5 \pm 4i$$

7. $x^2 + 6x = 27$

$$x^2 + 6x - 27 = 0$$

$$(x+9)(x-3) = 0$$

$$x+9=0 \quad | \quad x-3=0$$

$$x = -9 \quad | \quad x = 3$$

$$x = 3, -9$$

8. $x^2 + 4x - 6 = 0$

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

$$\frac{-4 \pm \sqrt{40}}{2}$$

$$\frac{-4 \pm 2\sqrt{10}}{2} = -2 \pm \sqrt{10}$$

9. $3x^2 - 24x = 27$

$$3(x^2 - 8x - 9) = 0$$

$$(x-9)(x+1) = 0$$

$$x-9=0 \quad | \quad x=-1$$

$$x = 9$$

x =

10. $2x^2 + 2x = 4x - 1$

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

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

$$\frac{2 \pm \sqrt{-4}}{4}$$

$$\frac{2 \pm 2i}{4} = \frac{1}{2} \pm \frac{1}{2}i$$

11. $(2x^3 + 5x^2)(-32x - 80) = 0$

$$x^2(2x+5) - 16(2x+5) = 0$$

$$(2x+5)(x^2-16) = 0$$

$$(2x+5)(x+4)(x-4) = 0$$

$$2x+5=0 \quad | \quad x+4=0 \quad | \quad x-4=0$$

$$2x=-5 \quad | \quad x=-4 \quad | \quad x=4$$

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

$$x = -\frac{5}{2}, \pm 4$$

$$12. x^2 - 6x = 40$$

$$x^2 - 6x - 40 = 0$$

$$(x-10)(x+4) = 0$$

$$x-10=0 \quad | \quad x+4=0$$

$$x=10 \quad | \quad x=-4$$

$$\boxed{x=10, -4}$$

$$15. x^2 + 81 = 0$$

$$x^2 = -81$$

$$\boxed{x = \pm 9i}$$

$$18. 25x^2 + 10x - 3 = 0$$

$$(5x-1)(5x+3) = 0$$

$$5x-1=0 \quad | \quad 5x+3=0$$

$$5x=1 \quad | \quad 5x=-3$$

$$x = \frac{1}{5} \quad | \quad x = -\frac{3}{5}$$

$$\boxed{x = \frac{1}{5}, -\frac{3}{5}}$$

$$21. 5x^2 + 25x = 0$$

$$5x(x+5) = 0$$

$$5x=0 \quad | \quad x+5=0$$

$$x=0 \quad | \quad x=-5$$

$$\boxed{x=0, -5}$$

$$13. 7x^2 + 6x + 2 = 0$$

$$\frac{-6 \pm \sqrt{6^2 - 4(7)(2)}}{2(7)}$$

$$2(7)$$

$$\frac{-6 \pm \sqrt{-20}}{14}$$

$$\frac{-6 \pm 2i\sqrt{5}}{14} = -\frac{3}{7} \pm \frac{\sqrt{5}}{7}i$$

$$16. 2x^2 + 11x + 5 = 0$$

$$(2x+1)(x+5) = 0$$

$$2x+1=0 \quad | \quad x+5=0$$

$$2x=-1 \quad | \quad x=-5$$

$$x = -\frac{1}{2} \quad |$$

$$\boxed{x = -\frac{1}{2}, -5}$$

$$19. (x-2)^2 - 7 = 3$$

$$(x-2)^2 = 10$$

$$x-2 = \pm\sqrt{10}$$

$$\boxed{x = 2 \pm \sqrt{10}}$$

$$22. 3x^2 + 5x = -11$$

$$3x^2 + 5x + 11 = 0$$

$$\frac{-5 \pm \sqrt{5^2 - 4(3)(11)}}{2(3)}$$

$$2(3)$$

$$\frac{-5 \pm \sqrt{-107}}{6}$$

$$\frac{-5 \pm \sqrt{107}i}{6}$$

$$14. (x+6)^2 - 8 = 16$$

$$(x+6)^2 = 24$$

$$x+6 = \pm 2\sqrt{6}$$

$$\boxed{x = -6 \pm 2\sqrt{6}}$$

$$17. (x^3 - 6x^2 - 4x + 24) = 0$$

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

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

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

$$x-6=0 \quad | \quad x+2=0 \quad | \quad x-2=0$$

$$x=6 \quad | \quad x=-2 \quad | \quad x=2$$

$$\boxed{x = 6, -2, 2}$$

$$20. 3x^2 = -6x - 12$$

$$3x^2 + 6x + 12 = 0$$

$$3(x^2 + 2x + 4) = 0$$

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

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

$$2(1)$$

$$\frac{-2 \pm \sqrt{-12}}{2} = \frac{-2 \pm 2i\sqrt{3}}{2} = -1 \pm i\sqrt{3}$$

$$23. x^2 = 6x + 5$$

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

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

$$2(1)$$

$$\frac{6 \pm \sqrt{56}}{2}$$

$$\frac{6 \pm 2\sqrt{14}}{2}$$

$$\boxed{3 \pm \sqrt{14}}$$