

Solving Quadratic Equations

Solve each quadratic equation by the method of your choice.

1. $x^2 + 15x + 24 = -32$ *Any

$$x^2 + 15x + 56 = 0$$

$$(x+7)(x+8) = 0$$

$$x = -7, x = -8$$

3. $x^2 - 11x + 24 = 0$ *Any

$$(x-8)(x-3) = 0$$

$$x = 8, x = 3$$

5. $12n^2 = -4n$ *Any

$$12n^2 + 4n = 0$$

$$4n(3n+1) = 0$$

$$4n = 0 \quad 3n+1 = 0$$

$$n = 0 \quad n = -1/3$$

7. $r^2 + 7r + 11 = 0$

$$r = \frac{-7 \pm \sqrt{49 - 4(1)(11)}}{2}$$

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

9. $(x+5)^2 + 12 = 0$ CTS

$$(x+5)^2 = -12$$

No Real Roots

11. $x^2 + 3x = -14$ QF

$$x^2 + 3x + 14 = 0$$

$$x = \frac{-3 \pm \sqrt{9 - 4(1)(14)}}{2} = \frac{-3 \pm \sqrt{-47}}{2}$$

No Real

13. $4x^2 + 8x = -3x$ Factor

$$4x^2 + 11x = 0$$

$$x(4x+11) = 0$$

$$x = 0$$

$$x = -11/4$$

15. $3x^2 + 7x - 24 = -13x$ QF

$$3x^2 + 20x - 24 = 0$$

$$x = \frac{-20 \pm \sqrt{400 - 4(3)(-24)}}{6} = \frac{-20 \pm \sqrt{688}}{6} = \frac{-20 \pm 4\sqrt{43}}{6}$$

$$= \frac{-10 \pm 2\sqrt{43}}{3}$$

2. $7x^2 - 10 = 25$ *Any

$$7x^2 - 35 = 0$$

$$7(x^2 - 5) = 0$$

$$x^2 - 5 = 0$$

$$x^2 = 5$$

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

4. $x^2 + 12x + 36 = 5$ *Perf. Sgu

$$(x+6)^2 = 5$$

$$x+6 = \pm \sqrt{5}$$

$$x = -6 \pm \sqrt{5}$$

CTS OR QF

6. $25x^2 = 121$ *Factor Diff. of Sgu.

$$25x^2 - 121 = 0$$

$$(5x+11)(5x-11) = 0$$

$$x = \pm 11/5$$

8. $x^2 + 2x + 3 = 0$ CTS, QF

$$x^2 + 2x + 1 = -3 + 1$$

$$(x+1)^2 = -2$$

No Real roots

10. $-6(x-4)^2 + 8 = 20$ CTS

$$-6(x-4)^2 = 12$$

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

No Real

12. $x^2 - 8x = -16$ CTS

$$x^2 - 8x + 16 = 0$$

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

$$x-4 = 0$$

$$x = 4$$

14. $6x^2 + 30 = 0$ Any

$$6(x^2 + 5) = 0$$

$$x^2 + 5 = 0$$

$$x^2 = -5$$

No Real

16. $2a^2 + 15a - 4 = 0$ QF

$$a = \frac{-15 \pm \sqrt{225 - 4(2)(-4)}}{4}$$

$$= \frac{-15 \pm \sqrt{257}}{4}$$