

5.2B Solve Quadratic Equations by Factoring: Part I

#1 - 3: Solve for x.

1. $(x-4)(x+9)=0$

$x=4 \text{ or } -9$

2. $(x-2)(3x-6)=0$

$x=2 \text{ (double root)}$

3. $(4x+3)(2x-5)=0$

$x=-\frac{3}{4} \text{ or } \frac{5}{2}$

#4 - 17: Factor the quadratic expression then solve the equation by factoring. Verify your solution(s).

4. $4x^2 - 36 = 0$

$4(x^2 - 9) = 0$

$4(x+3)(x-3) = 0$

$x = -3 \text{ or } 3$

$4(-3)^2 - 36 = 0 \checkmark$

$4(3)^2 - 36 = 0 \checkmark$

$4 \cdot 9 - 36$

✓ Verify your solution(s):

5. $5x^2 - 20 = 0$

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

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

$x = -2 \text{ or } 2$

$5(-2)^2 - 20 = 0 \checkmark$

$5(2)^2 - 20 = 0 \checkmark$

✓ Verify your solution(s):

6. $3x^2 - 9x = 0$

$3x(x-3) = 0$

$x = 0 \text{ or } x = 3$

$3(0)^2 - 9(0) = 0 \checkmark$

$3(3)^2 - 9(3) = 0 \checkmark$

✓ Verify your solution(s):

7. $7x^2 - 28x = 0$

$7x(x-4) = 0$

$x = 0 \text{ or } 4$

✓ Verify your solution(s):

$7(0)^2 - 28(0) = 0 \checkmark$

$7(4)^2 - 28(4)$

$7(16) - 28(4)$

$112 - 112 = 0 \checkmark$

8. $x^2 + 8x - 9 = 0$

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

$x = -9 \text{ or } x = 1$

✓ Verify your solution(s):

$(-9)^2 + 8(-9) - 9 = 0 \checkmark$

$81 - 72 - 9 = 0 \checkmark$

$(1)^2 + 8(1) - 9 = 0 \checkmark$

$1 + 8 - 9 = 0 \checkmark$

9. $x^2 + 7x + 12 = 0$

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

$x = -4 \text{ or } -3$

✓ Verify your solution(s):

$(-4)^2 + 7(-4) + 12 = 0 \checkmark$

$16 - 28 + 12 = 0 \checkmark$

$(-3)^2 + 7(-3) + 12 = 0 \checkmark$

$9 - 21 + 12 = 0 \checkmark$

5.2B Solve Quadratic Equations by Factoring: Part I

#4 – 17 (continued): Factor the quadratic expression then solve the equation by factoring. Verify your solution(s).

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

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

$$\boxed{x = 5}$$

✓ Verify your solution(s):

$$(5)^2 - 10(5) + 25 = 0$$

$$25 - 50 + 25 = 0 \checkmark$$

11. $x^2 - 3x = 4$

$$x^2 - 3x - 4 = 0$$

$$(x+1)(x-4) = 0$$

$$\boxed{x = -1, 4}$$

✓ Verify your solution(s):

$$(-1)^2 - 3(-1) = 4 \checkmark$$

$$1 + 3 = 4 \checkmark$$

$$(4)^2 - 3(4) = 4 \checkmark$$

$$16 - 12 = 4 \checkmark$$

12. $x^2 - 4x = 5$

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

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

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

✓ Verify your solution(s):

$$(-1)^2 - 4(-1) = 5 \checkmark$$

$$1 + 4 = 5 \checkmark$$

$$(5)^2 - 4(5) = 5 \checkmark$$

$$25 - 20 = 5 \checkmark$$

13. $x^2 - 13x = -40$

$$x^2 - 13x + 40 = 0$$

$$(x-8)(x-5) = 0$$

$$\boxed{x = 8, 5}$$

✓ Verify your solution(s):

$$(8)^2 - 13(8) = -40 \checkmark$$

$$64 - 104 = -40 \checkmark$$

$$(5)^2 - 13(5) = -40 \checkmark$$

$$25 - 65 = -40 \checkmark$$

14. $3x^2 + 10x + 8 = 0$

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

$$\boxed{x = -\frac{4}{3}, -2}$$

✓ Verify your solution(s):

$$3\left(-\frac{4}{3}\right)^2 + 10\left(-\frac{4}{3}\right) + 8 = 0 \checkmark$$

$$\frac{3}{1} \cdot \frac{16}{9} - \frac{40}{3} + \frac{24}{3} = 0 \checkmark$$

$$\frac{16}{3} - \frac{40}{3} + \frac{24}{3} = 0 \checkmark$$

$$3(-2)^2 + 10(-2) + 8 = 0 \checkmark$$

15. $8x^2 + 6x - 5 = 0$

$$(4x+5)(2x-1) = 0$$

$$\boxed{x = -\frac{5}{4}, \frac{1}{2}}$$

✓ Verify your solution(s):

$$8\left(-\frac{5}{4}\right)^2 + 6\left(-\frac{5}{4}\right) - 5 = 0 \checkmark$$

$$8 \cdot \frac{25}{16} - \frac{15}{2} - 5 = 0 \checkmark$$

$$\frac{25}{2} - \frac{15}{2} - 5 = 0 \checkmark$$

$$8\left(\frac{1}{2}\right)^2 + 6\left(\frac{1}{2}\right) - 5 = 0 \checkmark$$

$$8\left(\frac{1}{4}\right) + 3 - 5 = 0 \checkmark$$

$$2 + 3 - 5 = 0 \checkmark$$

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

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

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

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

✓ Verify your solution(s):

$$5\left(-\frac{1}{5}\right)^2 + 11\left(-\frac{1}{5}\right) + 2 = 0 \checkmark$$

$$5 \cdot \frac{1}{25} - \frac{11}{5} + \frac{10}{5} = 0 \checkmark$$

$$\frac{1}{5} - \frac{11}{5} + \frac{10}{5} = 0 \checkmark$$

$$5(-2)^2 + 11(-2) + 2 = 0 \checkmark$$

$$20 - 22 + 2 = 0 \checkmark$$

17. $2x^2 - 15x = 8$

$$2x^2 - 15x - 8 = 0$$

$$(2x+1)(x-8) = 0$$

$$\boxed{x = -\frac{1}{2}, 8}$$

✓ Verify your solution(s):

$$2\left(-\frac{1}{2}\right)^2 - 15\left(-\frac{1}{2}\right) - 8 = 0 \checkmark$$

$$2\left(\frac{1}{4}\right) + \frac{15}{2} - 8 = 0 \checkmark$$

$$\frac{1}{2} + \frac{15}{2} - 8 = 0 \checkmark$$

$$2(8)^2 - 15(8) - 8 = 0 \checkmark$$

$$128 - 120 - 8 = 0 \checkmark$$

Section 5.2B