

# Solving Quadratic Equations

- \* Use the notes you took while watching the video
- \* Complete at least some problems from each section below
- \* Find answers at the end of this document

## Part 1:

Isolate  $x^2$ . Then, take the square root on both sides.

- \* Do not forget that taking the square root produces a positive and negative.

**1** Solve for  $x$ :

**a**  $x^2 = 100$

**b**  $2x^2 = 50$

**c**  $5x^2 = 20$

**g**  $3x^2 - 2 = 25$

**h**  $4 - 2x^2 = 12$

**i**  $4x^2 + 2 = 10$

**2** Solve for  $x$ :

**a**  $(x - 1)^2 = 9$

**b**  $(x + 4)^2 = 16$

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

**g**  $(2x - 5)^2 = 0$

**h**  $(3x + 2)^2 = 4$

**i**  $\frac{1}{3}(2x + 3)^2 = 2$

**2** Solve for  $x$  using the Null Factor law:

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

**b**  $2x(x + 3) = 0$

**c**  $(x + 1)(x - 3) = 0$

**d**  $3x(7 - x) = 0$

**e**  $-2x(x + 1) = 0$

**f**  $4(x + 6)(2x - 3) = 0$

**g**  $(2x + 1)(2x - 1) = 0$

**h**  $11(x + 2)(x - 7) = 0$

**i**  $-6(x - 5)(3x + 2) = 0$

## Part 2:

Move everything to one side. Factor out the GCF. Use the Null Factor Law.

**1** Solve for  $x$ :

**a**  $x^2 - 7x = 0$

**d**  $x^2 = 4x$

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

**b**  $x^2 - 5x = 0$

**e**  $3x^2 + 6x = 0$

**h**  $4x^2 = 5x$

**c**  $x^2 = 8x$

**f**  $2x^2 + 5x = 0$

**i**  $3x^2 = 9x$

Part 3:

Factor using the X-Factor Method. Then, use the Null Factor Law.

**3** Solve for  $x$ :

**a**  $x^2 + 9x + 20 = 0$

**b**  $x^2 + 11x + 28 = 0$

**c**  $x^2 + 2x = 8$

**j**  $10 - 3x = x^2$

**k**  $x^2 + 12 = 7x$

**l**  $9x + 36 = x^2$

**4** Solve for  $x$ :

**a**  $2x^2 + 2 = 5x$

**d**  $2x^2 + 5x = 3$

**b**  $3x^2 + 8x = 3$

**e**  $2x^2 + 5 = 11x$

**c**  $3x^2 + 17x + 20 = 0$

**f**  $2x^2 + 7x + 5 = 0$

Part 4:

**6** Solve for  $x$  by first expanding brackets and then making one side of the equation zero:

**a**  $x(x + 5) + 2(x + 6) = 0$

**b**  $x(1 + x) + x = 3$

**c**  $(x - 1)(x + 9) = 8x$

**d**  $3x(x + 2) - 5(x - 3) = 17$

**e**  $4x(x + 1) = -1$

**f**  $2x(x - 6) = x - 20$

**7** Solve for  $x$  by first eliminating the algebraic fractions:

**a**  $\frac{x}{3} = \frac{2}{x}$

**b**  $\frac{4}{x} = \frac{x}{2}$

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

**d**  $\frac{x - 1}{4} = \frac{3}{x}$

**e**  $\frac{x - 1}{x} = \frac{x + 11}{5}$

**f**  $\frac{x}{x + 2} = \frac{1}{x}$

**g**  $\frac{2x}{3x + 1} = \frac{1}{x + 2}$

**h**  $\frac{2x + 1}{x} = 3x$

**i**  $\frac{x + 2}{x - 1} = \frac{x}{2}$

## ANSWERS

Part 1:

**1 a**  $x = \pm 10$       **b**  $x = \pm 5$       **c**  $x = \pm 2$

**g**  $x = \pm 3$       **h** no solution      **i**  $x = \pm\sqrt{2}$

**2 a**  $x = 4$  or  $-2$       **b**  $x = 0$  or  $-8$       **c** no solution

**g**  $x = 2\frac{1}{2}$       **h**  $x = 0$  or  $-\frac{4}{3}$       **i**  $x = \frac{\pm\sqrt{6} - 3}{2}$

**2 a**  $x = 0$  or  $5$       **b**  $x = 0$  or  $-3$       **c**  $x = -1$  or  $3$

**d**  $x = 0$  or  $7$       **e**  $x = 0$  or  $-1$       **f**  $x = -6$  or  $\frac{3}{2}$

**g**  $x = \pm\frac{1}{2}$       **h**  $x = -2$  or  $7$       **i**  $x = 5$  or  $-\frac{2}{3}$

Part 2:

- 1**   **a**  $x = 0$  or  $7$       **b**  $x = 0$  or  $5$       **c**  $x = 0$  or  $8$   
      **d**  $x = 0$  or  $4$       **e**  $x = 0$  or  $-2$       **f**  $x = 0$  or  $-\frac{5}{2}$   
      **g**  $x = 0$  or  $\frac{3}{4}$       **h**  $x = 0$  or  $\frac{5}{4}$       **i**  $x = 0$  or  $3$

Part 3:

- 3**   **a**  $x = -4$  or  $-5$     **b**  $x = -4$  or  $-7$     **c**  $x = -4$  or  $2$   
      **j**  $x = -5$  or  $2$       **k**  $x = 3$  or  $4$       **l**  $x = 12$  or  $-3$   
  
**4**   **a**  $x = \frac{1}{2}$  or  $2$       **b**  $x = -3$  or  $\frac{1}{3}$       **c**  $x = -4$  or  $-\frac{5}{3}$   
      **d**  $x = \frac{1}{2}$  or  $-3$       **e**  $x = \frac{1}{2}$  or  $5$       **f**  $x = -1$  or  $-\frac{5}{2}$

Part 4:

- 6**   **a**  $x = -4$  or  $-3$     **b**  $x = -3$  or  $1$       **c**  $x = \pm 3$   
      **d**  $x = -1$  or  $\frac{2}{3}$       **e**  $x = -\frac{1}{2}$       **f**  $x = \frac{5}{2}$  or  $4$   
  
**7**   **a**  $x = \pm\sqrt{6}$       **b**  $x = \pm\sqrt{8}$       **c**  $x = \pm\sqrt{10}$   
      **d**  $x = 4$  or  $-3$       **e**  $x = -1$  or  $-5$       **f**  $x = 2$  or  $-1$   
      **g**  $x = \frac{1}{2}$  or  $-1$       **h**  $x = 1$  or  $-\frac{1}{3}$       **i**  $x = -1$  or  $4$