Solving Quadratic Equations, Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}; \quad ax^2 + bx + c = 0$$

Algorithm

1. **Place everything on one side, zero on the other side.**
2. **Label a, b and c**
3. **Substitute into the Quadratic Formula**

Example **Solve by the Quadratic Formula $3x^2 = 2x + 1$**

1. $3x^2 - 2x - 1 = 0$
2. $a = 3,\ b = -2$ and $c = -1$
3. $x = \frac{-(-2) \pm \sqrt{((-2)^2 - 4(3)(-1))}}{(2)(3)}$

$$x = \frac{2 \pm \sqrt{4+12}}{6} = \frac{2 \pm \sqrt{16}}{6} = \frac{2 \pm 4}{6}$$

$x = 1$ **OR** $x = -2/6 = 1/3$

Solve, using the Quadratic Formula

1. $x^2 - 8x + 15 = 0$
2. $x^2 + 7x - 8 = 0$
3. $x^2 + x - 42 = 0$
4. $x^2 - 11x + 30 = 0$
5. $2x^2 - x - 1 = 0$
6. $6x^2 - x - 15 = 0$
7. $4x^2 - 23x = 6$
8. $15x^2 - 16x = 15$

9. $8x^2 - 6x = -1$

10. $3x^2 - 20x = 7$

11. $x^2 - 4x + 1 = 0$

12. $x^2 + 10x + 21 = 0$

13. $4x^2 - 12x + 7 = 0$

14. $9x^2 + 6x - 4 = 0$

15. $x^2 + 10x + 19 = 0$

16. $3x^2 + 12x + 8 = 0$

17. How was the Quadratic Formula derived?