

What have you learnt about solving a quadratic equation using the formula?

1. Complete the formula we use to solve a quadratic equation when it is written in the order

$$ax^2 + bx + c = 0$$

 $x =$

You must learn the quadratic formula

2. Who identifies the values of a, b and c correctly, Helen or Susan?

	Helen	Susan
a. $x^2 - 4x + 1 = 0$	$a = 1 \quad b = -4 \quad c = 1$	$a = 1 \quad b = 4 \quad c = 1$
b. $3x + 2x^2 - 3 = 0$	$a = 3 \quad b = 2 \quad c = -3$	$a = 2 \quad b = 3 \quad c = -3$
c. $2x^2 - 5x = 4$	$a = 2 \quad b = -5 \quad c = -4$	$a = 2 \quad b = -5 \quad c = 4$
d. $3x^2 = 5 - 2x$	$a = 3 \quad b = 2 \quad c = -5$	$a = 3 \quad b = -2 \quad c = 5$

3. Identify the errors made using the quadratic formula, then write it correctly.

a. $x^2 + 6x - 2 = 0$

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

$$x = \frac{6 \pm \sqrt{36 - 8}}{2}$$

$$x = \frac{6 \pm \sqrt{28}}{2}$$

$$x = \frac{6 + \sqrt{28}}{2} \quad x = \frac{6 - \sqrt{28}}{2}$$

b. $x^2 - 5x + 1 = 0$

$$x = \frac{-5 \pm \sqrt{-5^2 - (4 \times 1 \times 1)}}{2 \times 1}$$

$$x = \frac{-5 \pm \sqrt{25 - 4}}{2}$$

$$x = \frac{-5 \pm \sqrt{21}}{2}$$

$$x = \frac{-5 + \sqrt{21}}{2} \quad x = \frac{-5 - \sqrt{21}}{2}$$

c. $4x^2 - 2x - 1 = 0$

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

$$x = \frac{2 \pm \sqrt{-4 - -16}}{8}$$

$$x = \frac{2 \pm \sqrt{12}}{8}$$

$$x = \frac{2 + \sqrt{12}}{8} \quad x = \frac{2 - \sqrt{12}}{8}$$

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

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

Answers

1. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

2. Who identifies the values of a, b and c correctly, Helen or Susan?

	Helen	Susan
a. $x^2 - 4x + 1 = 0$	$a = 1$ $b = -4$ $c = 1$ ✓	$a = 1$ $b = 4$ $c = 1$
b. $3x + 2x^2 - 3 = 0$ $2x^2 + 3x - 3 = 0$	$a = 3$ $b = 2$ $c = -3$	$a = 2$ $b = 3$ $c = -3$ ✓
c. $2x^2 - 5x = 4$ $2x^2 - 5x - 4 = 0$	$a = 2$ $b = -5$ $c = -4$ ✓	$a = 2$ $b = -5$ $c = 4$
d. $3x^2 = 5 - 2x$ $3x^2 + 2x - 5 = 0$	$a = 3$ $b = 2$ $c = -5$ ✓	$a = 3$ $b = -2$ $c = 5$

3. Identify the errors made using the quadratic formula, then write it correctly.

a. $x^2 + 6x - 2 = 0$	$x = \frac{6 \pm \sqrt{6^2 - (4 \times 1 \times -2)}}{2 \times 1}$	$x = \frac{-6 \pm \sqrt{6^2 - (4 \times 1 \times -2)}}{2 \times 1}$
	$x = \frac{6 \pm \sqrt{36 - 8}}{2}$	$x = \frac{-6 \pm \sqrt{36 - 8}}{2}$
	$x = \frac{6 \pm \sqrt{28}}{2}$	$x = \frac{-6 \pm \sqrt{44}}{2}$
	$x = \frac{6 + \sqrt{28}}{2}$ $x = \frac{6 - \sqrt{28}}{2}$	$x = \frac{-6 + \sqrt{44}}{2}$ $x = \frac{-6 - \sqrt{44}}{2}$

b. $x^2 - 5x + 1 = 0$	$x = \frac{-5 \pm \sqrt{-5^2 - (4 \times 1 \times 1)}}{2 \times 1}$	$x = \frac{5 \pm \sqrt{(-5)^2 - (4 \times 1 \times 1)}}{2 \times 1}$
	$x = \frac{-5 \pm \sqrt{25 - 4}}{2}$	$x = \frac{5 \pm \sqrt{25 - 4}}{2}$
	$x = \frac{-5 \pm \sqrt{21}}{2}$	$x = \frac{5 \pm \sqrt{21}}{2}$
	$x = \frac{-5 + \sqrt{21}}{2}$ $x = \frac{-5 - \sqrt{21}}{2}$	$x = \frac{5 + \sqrt{21}}{2}$ $x = \frac{5 - \sqrt{21}}{2}$

c. $4x^2 - 2x - 1 = 0$	$x = \frac{2 \pm \sqrt{-2^2 - (4 \times 4 \times -1)}}{2 \times 4}$	$x = \frac{2 \pm \sqrt{(-2)^2 - (4 \times 4 \times -1)}}{2 \times 4}$
	$x = \frac{2 \pm \sqrt{-4 - 16}}{8}$	$x = \frac{2 \pm \sqrt{4 - 16}}{8}$
	$x = \frac{2 \pm \sqrt{12}}{8}$	$x = \frac{2 \pm \sqrt{20}}{8}$
	$x = \frac{2 + \sqrt{12}}{8}$ $x = \frac{2 - \sqrt{12}}{8}$	$x = \frac{2 + \sqrt{20}}{8}$ $x = \frac{2 - \sqrt{20}}{8}$

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

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

$$x = \frac{4 \pm \sqrt{8}}{4}$$

$$x = 1.71 \text{ (2dp)} \text{ or } x = 0.29 \text{ (2dp)}$$

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

$$x = \frac{-2 \pm \sqrt{2^2 - (4 \times 3 \times -2)}}{2 \times 3}$$

$$x = \frac{-2 \pm \sqrt{28}}{6}$$

$$x = 0.55 \text{ (2dp)} \text{ or } x = -1.22 \text{ (2dp)}$$