EQUATIONS

Solve the equations problem using algebra method and formula

There are two methods that are commonly used for solving quadratic equations:

Method 1: Factoring Method

Method 2: Quadratic Formula

Method 1 : Solving quadratic equations using <u>Factoring Method</u>

- Make sure that the equation is rearranged so that the right-hand side is 0
- Inverse operations can be applied to get the equation to equal zero.

Example :

Solve the quadratic equation $x^2 - 5x + 6 = 0$ **using the factoring method**

Solution:

1. Identify a, b and c from the quadratic equation $x^2 - 5x + 6 = 0$

   a b c

   a = 1, b = - 5, c = 6

2. Insert value a, b and c into the calculator :

   1. Press MODE MODE MODE (3 times).
   2. Press 1 (to select EQN).
   3. Press > (right arrow).
   4. When prompted with Degree?, press 2.
   5. Identify the values of a, b, and c in the equation. This is why it's important to arrange the equation in standard form.
   6. Enter the value of a and press =. repeat for b and c, ensuring positive/negative signs for value a, b and c correctly.

   $$x^2 - 5x + 6 = 0$$
   $$(x - 2)(x - 3) = 0$$
   $$x - 2 = 0 \quad \text{or} \quad x - 3 = 0$$
   $$x = 2 \quad \text{or} \quad x = 3$$

Method 2 : Solving Quadratic Equations using <u>Quadratic formula</u>

- Not every quadratic equation can be solved by factoring.

- The following is the formula for a quadratic equation.

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

METHOD 2 : QUADRATIC FORMULA

Example :

Solve $x^2 - 5x + 6 = 0$ **using the quadratic formula**

Solution:

1. Identify a, b, and c:

   a = 1, b = –5, c = 6

2. Apply the quadratic formula:

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

   $$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(6)}}{2(1)}$$

   $$x = \frac{5 \pm \sqrt{1}}{2(1)}$$

   $$x = \frac{5 + 1}{2} \quad \text{or} \quad x = \frac{5 - 1}{2}$$

   x = 3 , 2

METHOD 2 : QUADRATIC FORMULA

Example :

Solve $2h^2 - 5h - 6 = 0$ using the quadratic formula

Solution:

$a = 2, \ b = -5, \ c = -6$

$$h = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$h = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-6)}}{2(2)}$$

$$h = \frac{5 \pm \sqrt{73}}{4}$$

$$h = \frac{(5 + 8.544)}{4} \qquad\qquad h = \frac{(5 - 8.544)}{4}$$

$$h = \frac{13.544}{4} \qquad\qquad h = \frac{-3.544}{4}$$

$$h = 3.386 \qquad\qquad h = -0.886$$

THANK YOU