

Quadratic Formative assessment

Question 1. State which all quadratic equations have real roots, no real roots

- a) $x^2 + x + 7 = 0$
- b) $3x^2 + 6x + 1 = 0$
- c) $9x^2 + x + 3 = 0$
- d) $11x^2 - 12x - 1 = 0$
- e) $-13x^2 + 3x + 7 = 0$
- f) $2x^2 - 6x + 3 = 0$
- g) $x - (1/x) - 3 = 0 \quad x \neq 0$
- h) $-x^2 - 2x - 2 = 0$

Solution

Nature of roots of Quadratic equation

S.no	Condition	Nature of roots
1	$b^2 - 4ac > 0$	Two distinct real roots
2	$b^2 - 4ac = 0$	One real root
3	$b^2 - 4ac < 0$	No real roots

Real roots: : (b), (d), (e), (f), (g)

No real roots : (a) ,(c),(h)

Question 2. Find the roots of the quadratic equation using factorization technique

a) $x^2 - 3x - 10 = 0$

b) $x^2 - 11x + 30 = 0$

Solution

a)

$$x^2 - 5x + 2x - 10 = 0$$

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

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

So roots are $x = -2$ and 5

b) Roots are 5 and 6

Question 3. Find the roots of the quadratic equation using square method

a) $x^2 + 4x - 5 = 0$

b) $2x^2 - 7x + 3 = 0$

Solution

a)

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

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

$$(x+2)^2 = 9$$

$$x+2=\pm 3$$

$$x=1 \text{ or } -5$$

b)

$$(x-7/4)^2 - (7/4)^2 + 3/2 = 0$$

$$(x-7/4)^2 = 49/16 - 3/2$$

$$(x-7/4)^2 = 25/16$$

$$x-7/4 = \pm 5/4$$

or

$$x = 1/2 \text{ or } 3$$

Question 4 - True or False statement

- There are no real roots of the quadratic equation $x^2+4x+5=0$
- The roots of the equation $x^2-1=0$ are 1, -1
- A quadratic equation can have at most 2 real roots
- In a quadratic equation $ax^2+bx+c=0$, if a and c are of the same sign and b is zero, the quadratic equation has real roots
- In a quadratic equation $ax^2+bx+c=0$, if a and c are of opposite sign, then the quadratic equation will definitely have real roots
- For $k > 0$, the quadratic equation $2x^2+6x-k=0$ will definitely have real roots
- If the roots of the quadratic equation are rational, the coefficient of the term x will also be rational.
- If the roots of the quadratic equation are irrational, the coefficient of the term x will also be irrational
- Every quadratic equation will have rational roots

Solution

- True
- True
- True
- False
- True
- True
- True
- True
- False

Multiple choice Questions

Question 7 Find a natural number whose square diminished by 84 is thrice the 8 more of given number

- a) 21
- b) 13
- c) 11
- d) 12

Solution (d)

$$x^2 - 84 = 3(x + 8)$$

$$x^2 - 3x - 108 = 0$$

$$x = 12 \text{ or } -9$$

So answer is 12

Question 8. The roots of the quadratic equation

$$x^2 + 14x + 40 = 0 \text{ are}$$

- a) (4, 10)
- b) (-4, 10)
- c) (-4, -10)
- d) (4, -10)

Solution (c)

Question 9 The equation

$$x^5 + x + 20 = 0$$

- a) is a quadratic equation
- b) is not a quadratic equation

Solution b

Question 10. The roots of the quadratic equation

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

- a) are real
- b) are not real

Solution (b)