UDAAN 2025

MATHS

Quadratic Equation

DHA : 01

Q1 Solve the following quadratic equation by factorization:
$x^2 + 6x + 5 = 0$

Q2 Solve the following quadratic equation by factorization:
$8x^2 - 22x - 21 = 0$

Q3 Solve the following quadratic equation by factorization:
$9x^2 - 3x - 2 = 0$

Q4 If x = 2 and x = 3 are roots of the equation $3x^2 - 2kx + 2m = 0$ find the value of k and m.

Q5 Solve the following quadratic equation by factorization method:
$x^2 + 2\sqrt{2}x - 6 = 0$

Q6 Solve the following quadratic equation by factorization method:
$\sqrt{3}x^2 + 10x + 7\sqrt{3} = 0$

Q7 Which of the following is a quadratic equation?
(A) $x^2 - 3\sqrt{x} + 2 = 0$ (B) $x + \frac{1}{x} = x^2$
(C) $x^2\frac{1}{x^2} = 5$ (D) $2x^2 - 5x = (x-1)^2$

Q8 Which of the following is not a quadratic equation?
(A) $3x - x^2 = x^2 + 5$ (B) $(x+2)^2 = 2(x^2 - 5)$
(C) $(\sqrt{2}x + 3)^2 = 2x^2 + 6$ (D) $(x-1)^2 = 3x^2 + x - 2$

Q9 If one root of the quadratic equation $2x^2 + ax + 6 = 0$ is 2 then a= ?
(A) 7 (B) -7
(C) $\frac{7}{2}$ (D) $\frac{-7}{2}$

Q10 The roots of the quadratic equation $2x^2 - x - 6 = 0$ are:
(A) $-2, \frac{3}{2}$ (B) $2, \frac{-3}{2}$
(C) $-2, \frac{-3}{2}$ (D) $2, \frac{3}{2}$

Answer Key

Q1 x = –5 and x = –1 are two roots of the equation $x^2 + 6x + 5 = 0$

Q2 $x = \frac{7}{2}\ and\ x = -\frac{3}{4}$ are two roots of the equation $8x^2 - 22x - 21 = 0$

Q3 $x = -\frac{1}{3}$ and $x = -\frac{2}{3}$ are two roots of the equation $9x^2 - 3x - 2 = 0$

Q4 $k = \frac{15}{2}$ and m = 9

Q5 $x = -3\sqrt{2}$ and $x = \sqrt{2}$ are two roots of the given equaiton.

Q6 $x = -\sqrt{3}$ and, $x = -\frac{7}{\sqrt{3}}$ are two roots of the given equation.

Q7 (D)

Q8 (C)

Q9 (B)

Q10 (B)

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

we hvae,

$x^2 + 6x + 5 = 0$

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

$\Rightarrow x(x + 5) + (x + 5) = 0$

$\Rightarrow$(x + 5)(x + 1) = 0 $\Rightarrow$x + 5 = 0 or, x + 1 = 0 $\Rightarrow$x = – 5 or,x = –1

Thus, x = –5 and x = –1 are two roots of the equation $x^2 + 6x + 5 = 0$

Video Solution:

Q2 Text Solution:

We have,

$8x^2 - 22x - 21 = 0$

$\Rightarrow\ 8x^2 - 28x + 6x - 21 = 0$

$\Rightarrow 4x(2x - 7) + 3(2x - 7) = 0$

$\Rightarrow$(2x – 7) (4x + 3) = 0$\Rightarrow$2x – 7 = 0 or, 4x + 3 = 0

$\Rightarrow x = \frac{7}{2} or, x = -\frac{3}{4}$

thus, $x = \frac{7}{2}\ and\ x = -\frac{3}{4}$ are two roots of the equation $8x^2 - 22x - 21 = 0$

Video Solution:

Q3 Text Solution:

We have,

$9x^2 - 3x - 2 = 0$

$\Rightarrow\ 9x^2 - 6x + 3x - 2 = 0$

$\Rightarrow\ 3x(3x - 2) + (3x - 2) = 0$

$\Rightarrow\ (3x - 2)(3x + 1) = 0$

$\Rightarrow\ 3x - 2 = 0\, or,\ 3x + 1 = 0 \Rightarrow x = \frac{2}{3}\, or,$

$x = -\frac{1}{3}$

Thus, $x = \frac{2}{3}$ and $x = -\frac{1}{3}$ are two roots of the equation $9x^2 - 3x - 2 = 0$

Video Solution:

Q4 Text Solution:

It is given that x = 2 and x = 3 are roots of the equation $3x^2 - 2kx + 2m = 0$

$\therefore\quad 3 \times 2^2 - 2k \times 2 + 2m = 0$ and $3 \times 3^2 - 2k \times 3 + 2m = 0$

$\Rightarrow$ 12 – 4k + 2m = 0 and 27– 6k + 2m = 0

$\Rightarrow$ 12 = 4k – 2m----------(i)

27 = 6k – 2m----------(ii)

From equation (i) & (ii) , we get $k = \frac{15}{2}$ and m = 9

Video Solution:

Q5 Text Solution:

We have,

$x^2 + 2\sqrt{2}x - 6 = 0$

$\Rightarrow\ x^2 + 3\sqrt{2}x - \sqrt{2}x - 6 = 0$

$\Rightarrow\ x\left(x + 3\sqrt{2}\right) - \sqrt{2}\left(x + 3\sqrt{2}\right) = 0$

$\Rightarrow\ \left(x + 3\sqrt{2}\right)\left(x - \sqrt{2}\right) = 0$

$\Rightarrow x + 3\sqrt{2} = 0\, or,\ x - \sqrt{2} = 0$

$\Rightarrow x = -3\sqrt{2}\, or,\ x = \sqrt{2}$

thus, $x = -3\sqrt{2}$ and $x = \sqrt{2}$ are two roots of the given equaiton.

Video Solution:

Q6 **Text Solution:**

$\sqrt{3}x^2 + 10x + 7\sqrt{3} = 0$

$\Rightarrow \sqrt{3}x^2 + 3x + 7x + 7\sqrt{3} = 0$

$\Rightarrow \sqrt{3}x(x + \sqrt{3}) + 7(x + \sqrt{3}) = 0$

$\Rightarrow (x + \sqrt{3})(\sqrt{3}x + 7) = 0$

$\Rightarrow x + \sqrt{3} = 0\, or,\ \sqrt{3}x + 7 = 0$

$\Rightarrow x = -\sqrt{3}\, or,\ = \frac{-7}{\sqrt{3}}$

Thus, $x = -\sqrt{3}$and, $x = -\frac{7}{\sqrt{3}}$ are two roots of the given equation.

Video Solution:

Q7 **Text Solution:**

$2x^2 - 5x = (x - 1)^2$

$2x^2 - 5x = x^2 + 1 - 2x$

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

$x^2 - 3x - 1 = 0$

Video Solution:

Q8 **Text Solution:**

$(\sqrt{2}x + 3)^2 = 2x^2 + 6$

$2x^2 + 9 + 6\sqrt{2}x = 2x^2 + 6$

$9 + 6\sqrt{2}x = 6$

$3 + 6\sqrt{2}x = 0$

$It\ is\ a\ linear\ equation\ of\ one\ variable.$

Video Solution:

Q9 **Text Solution:**

$2x^2 + ax + 6 = 0 \qquad (\because\ x = 2)$

$2 \times 2^2 + 2a + 6 = 0$

$8 + 2a + 6 = 0$

$2a = -14$

$a = -7$

Video Solution:

Q10 **Text Solution:**

$2x^2 - x - 6 = 0$

$\left(Middle\ Term\ splitting\right)$

$2x^2 - 4x + 3x - 6 = 0$

$2x\left(x - 2\right) + 3\left(x - 2\right) = 0$

$\left(x - 2\right)\left(2x + 3\right) = 0$

$x = 2\ and\ x = \frac{-3}{2}$

Video Solution: