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Class: EM - CLASS 10 | **Subject:** Mathematics - Part 1 (Algebra) | **Time:**30 mins
Date: 12-05-2025 | **Paper:** Class Test (Solution) | **Marks:**20

1)
(1) $x = \sqrt{3}$
(2) $(x + 2)(x - 1) = x^2 - 2x - 3$
(3) $7(3x + 4y)(3x - 4y)$
(4) 4

2)
(1) $2y = 10 - y^2$
$\therefore y^2 + 2y - 10 = 0$
Comparing with $ay^2 + by + c = 0$ [Here y = x] we get,
$a = 1, b = 2, c = -10$

(2) $7m^2 = 21m$
$\therefore 7m - 21m = 0$
$\therefore 7m(m - 3) = 0$
$\therefore 7m = 0$ or $m - 3 = 0$
$\therefore m = \frac{0}{7}$ or $m = 3$
$\therefore m = 0$ or $m = 3$
$\therefore$ The roots of the given quadratic equation are 0 and 3.

3)
(1) $\sqrt{5}x^2 - x - \sqrt{5} = 0$
Comparing with $ax^2 + bx + c = 0$ we get,
$a = \sqrt{5}, b = -1, c = -\sqrt{5}$
$\triangle = b^2 - 4ac$
$= (-1)^2 - 4 \times \sqrt{5} \times -\sqrt{5}$
$= 1 + 20$
$\triangle = 21$

(2) $2y^2 - 5y + 10 = 0$
Comparing with $ay^2 + by + c = 0$ [Here y = x] we get,
$a = 2, b = -5, c = 10$
$\triangle = b^2 - 4ac$
$= (-5)^2 - 4 \times 2 \times 10$
$= 25 - 80$
$\therefore \triangle = -55$

4)
(1) $5m^2 = 22m + 15$
$\therefore 5m^2 - 22m - 15 = 0$
$\therefore 5m^2 - 25m + 3m - 15 = 0$
$\therefore 5m(m - 5) + 3(m - 5) = 0$
$\therefore (m - 5)(5m + 3) = 0$

∴ m - 5 = 0 or 5m + 3 = 0
∴ m = 5 or 5m = -3
∴ m = 5 or m = - $\frac{3}{5}$
∴ The roots of the given quadratic equation are 5 and - $\frac{3}{5}$.

(2) $\sqrt{3}x^2 + \sqrt{2}x - 2\sqrt{3} = 0$
Comparing with $ax^2 + bx + c = 0$ we get,
$a = \sqrt{3}$, $b = \sqrt{2}$, $c = -2\sqrt{3}$
$\triangle = b^2 - 4ac$
$= (\sqrt{2})^2 - 4 \times \sqrt{3} \times -2\sqrt{3}$
$= 2 + 24$
$\therefore \triangle = 26$
As $\triangle > 0$, the roots of the quadratic equation are real and unequal.

5)
(1) Let the bigger number be x.
Now the difference between squares of two number is 120.
∴ x − square of smaller number = 120
∴ square of smaller number = x − 120
According to given condition
x − 120 = 2x
∴ x − 2x − 120 = 0
∴ x − 12x + 10x − 120 = 0
∴ x(x − 12) + 10(x − 12) = 0
∴ (x − 12)(x + 10) = 0
∴ x − 12 = 0 or x + 10 = 0
∴ x = 12 or x = −10
x ≠ -10 as x is a bigger number.
∴ x = 12
Now, square of smaller number = x − 120
= (12) − 120
= 144 − 120
= 24
∴ Smaller number = $\sqrt{24}$
$= \sqrt{4} \times 6$
$= 2\sqrt{6}$
∴ The required number are 12 and $2\sqrt{6}$.

(2) $y^2 - 2y - 7 = 0$
Comparing with $ay^2 + by + c = 0$ ...[Here y = x] we get,
a = 1, b = -2, c = -7
∴ $\propto + \beta = \frac{-b}{a} = \frac{-(-2)}{1}$ = 2 and

$\propto \beta = \frac{c}{a} = \frac{-7}{1}$ = - 7

(1) $\propto^2 + \beta^2 = (\propto + \beta)^2 - 2 \propto \beta$
$= (2)^2 - 2 \times (-7)$
$= 4 + 14$
$= 2$
∴

$\alpha^2 + \beta^2 = 18$

(2) $\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$

$= (2)^3 - 3 \times (-7) \times 2$

$= 8 + 42$

$= 3$

$\therefore \alpha^3 + \beta^3 = 50$

All the Best