

Algebra

Q. $(2kx^2 + 5kx + 2) = 0$ find k for equal roots?

→ If equation has equal roots

$$b^2 - 4ac = 0$$

$$25k^2 - 4 \times 2k \times 2 = 0$$

$$25k^2 = 16k$$

$$K = \frac{16}{25}$$

Q. which of the following have real roots?

→ If equation has real roots $b^2 - 4ac = 0$

∴ from options choose.

Q. $x^2 - 3x + 1 = 0$ then value of $x + \frac{1}{x}$ is;

$$\rightarrow x^2 + 1 = 3x \Rightarrow \frac{x^2 + 1}{x} \Rightarrow \frac{3x}{x} \Rightarrow 3$$

Q. $(2 \pm i\sqrt{3})$ roots of $x^2 + px + q = 0$, p, q are -

$$\rightarrow \alpha + \beta = 4$$

$$\begin{aligned} \alpha\beta &= (2 + i\sqrt{3})(2 - i\sqrt{3}) = (2^2 - (i\sqrt{3})^2) \\ &= 4 - (-1 \times 3) \\ &= 7 \end{aligned}$$

$$\alpha + \beta = -\frac{p}{1} = 4$$

$$\alpha\beta = \frac{q}{1} = 7$$

$$[P = -4, q = 7]$$

Q. If a, b are roots of eq. and $a+b=24$, $a-b=8$ then eq. is -

a) $2x^2 + 8x + 9 = 0$

b) $x^2 - 4x + 8 = 0$

✓ c) $x^2 - 24x + 128 = 0$

d) $x^2 - 22x + 8 = 0$

$$\rightarrow a+b = 24 = -\frac{b}{a} \therefore \text{C) is correct.}$$

$$ab = 16 \times 8 = \frac{c}{a} \therefore \text{C) is correct.}$$

Q. $2x^2 + 3x + p = 0$ roots are equal $p = ?$

→ roots are equal then

$$b^2 = 4ac$$

$$9 = 4 \times 2 \times p$$

$$p = \frac{9}{8}$$

Q. out of 12 pipes that are connected to tank

Q. two pipe fills tank in 8 hrs and 6 hrs respectively if they opened alternately if pipe A gets opened first then in how many time tank gets full?

→ Let time be x then half time taken by each pipe approximately.

$$\therefore \begin{array}{c} 8 \\ 6 \end{array} \begin{array}{c} 3 \\ 4 \end{array} \rightarrow 24$$

$$8 \times \frac{x}{2} + 6 \times \frac{x}{2} = 24$$

$$x \approx 7 \text{ hrs}$$

Q.