

Model Answer

Q(1) Answer(a)

\therefore The points of intersection with the X – axis are $(-5, 0), (\frac{3}{2}, 0)$

\therefore The 2 roots are -5 and $\frac{3}{2}$

$$\text{Sum} = -5 + \frac{3}{2} = \frac{-7}{2}, \text{ Product} = -5 \times \frac{3}{2} = \frac{-15}{2}$$

$$\Rightarrow \frac{-15}{a} = \frac{-15}{2} \Rightarrow a = 2 \text{ and } \frac{-c}{a} = \frac{-7}{2} \Rightarrow \frac{-c}{2} = \frac{-7}{2} \Rightarrow c = 7 \Rightarrow a + c = 9$$

Q(2) Answer(b)

$$\therefore L = \pi r \Rightarrow 8\pi = \pi r \Rightarrow r = 8$$

Q(3) Answer(c)

$$[-2, 2]$$

Q(4) Answer(a)

$$\therefore \text{The 2 roots are } \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{2k \pm \sqrt{4k^2 - 4(k^2 - 1)}}{2} = \frac{2k \pm 2}{2} = k \pm 1$$

$$\Rightarrow -2 < k + 1 < 4 \Rightarrow -3 < k < 3 \text{ and } -2 < k - 1 < 4 \Rightarrow -1 < k < 5$$

$$\Rightarrow k \in]-3, 3[\cap]-1, 5[=]-1, 3[$$

Q(5) Answer(c)

$$\therefore \overline{AD} \text{ bisects } \angle BAC \Rightarrow \frac{AC}{AB} = \frac{CD}{DB} \Rightarrow \frac{AC}{12} = \frac{6}{DB} \Rightarrow AC \cdot DB = 72 \text{ --- (1)}$$

$$\text{Surface area of } \triangle ADB = \frac{1}{2} \times DB \times AC = \frac{1}{2} \times 72 = 36 \text{ cm}^2$$

$$\therefore \overline{BH} \text{ is a median} \Rightarrow \text{S.A}(\triangle BDH) = \frac{1}{2} \text{S.A}(\triangle BDA) = 18 \text{ cm}^2$$

Q(6) Answer(b)

$$\because m(\angle AEB) = \frac{1}{2}(40^\circ + 50^\circ) = 45^\circ \Rightarrow m(\angle AED) = 135^\circ \Rightarrow \text{Sec}(\angle AED) = -\sqrt{2}$$

Q(7)

$$\because f \text{ is + ve } \Rightarrow b^2 - 4ac < 0 \Rightarrow 4k^2 - 4 \times 1 \times (5k - 4) < 0 \Rightarrow 4k^2 - 20k + 16 < 0 \\ \div 4 \Rightarrow k^2 - 5k + 4 < 0 \Rightarrow k \in]1, 4[$$

Q(8)

$$A = -2 + 5i, B = -5 + 2i \Rightarrow A - B = -2 + 5i + 5 - 2i = 3(1 + i)$$

Q(9)

$$\because \overline{AB} // \overline{CD} // \overline{EF} // \overline{LM} \Rightarrow x^2 + 2 = 3x + 6 \Rightarrow x^2 - 3x - 4 = 0 \Rightarrow x = -1, x = 4 \\ \Rightarrow DF = FM \Rightarrow 6y = 3x + 6 \Rightarrow 6y = 18 \Rightarrow y = 3 \text{ or } 6y = 3 \Rightarrow y = \frac{1}{2}$$

Q(10)

$$\text{Let } D(x, y) \Rightarrow x = 1 \Rightarrow \tan \theta = \frac{DA}{AD} \Rightarrow \tan \theta = y \Rightarrow D(1, \tan \theta)$$

Q(11)

$$\because AB = 2MB \Rightarrow AC = CB = MB = x$$

$$\because CB \times CA = CD \times CE \Rightarrow x^2 = 64 \Rightarrow x = 8 \text{ cm}$$

$$\because \overline{MD} \text{ is a tangent } \Rightarrow (MD)^2 = MB \times MA \Rightarrow MD = \sqrt{8 \times 24} = 8\sqrt{3}$$

Q(12)

$$\text{Let } MD = ME = x \Rightarrow AE = 2x, \because MD \times ME = MC \times MB \Rightarrow x^2 = 4 \Rightarrow x = 2$$

$$(AB)^2 = AE \times AD = 4 \times 8 \Rightarrow P_N(A) = (AB)^2 = 32$$