SUMMATIVE ASSESSMENT - II - 2016 - 2017

CLASS-X - MATHS - PAPER-II

Part - A & B

KEY

Class : X **Part - A** **Marks : 60**

Section - I (Each question carries 1 mark)

1. Given points A(2, 5); B (6, 1)

Distance between two points AB $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\left.\right\} \frac{1}{2}m$

$$= \sqrt{(6-2)^2 + (1-5)^2}$$

$$= \sqrt{(4)^2 + (-4)^2}$$

$$= \sqrt{16+16}$$

$$= \sqrt{32}$$

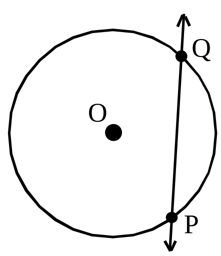
$$= 4\sqrt{2} \text{ units}$$

$\frac{1}{2}m$

1m

2. **A.A Law of Similarity :**
If two angles of one triangle are respectively equal to the two angles of another triangle, then the two triangles are similar. 1m

3.



4. Cos (A+B) = Cos A + Cos B is not right
Let us take A = 60°; B = 30° then $\left.\right\} \frac{1}{2}m$

Cos (A+B) = Cos (60°+30°) = Cos 90° = 0

Cos A + Cos B = Cos 60° + Cos 30° $= \frac{\sqrt{3}}{2} + \frac{1}{2} = \frac{\sqrt{3}+1}{2}$

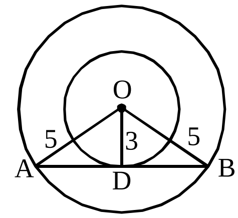
$\therefore$ Cos (A+B) $\neq$ Cos A + Cos B

$\frac{1}{2}m$

Section - II (Each question carries 2 marks)

5. Let 'O' be the centre of the two concentric circles.

'AB' is the chord of the larger circle which touches the smaller circle



OA = OB = 5cm (radii of larger circle)

OD = 3cm (radius of smaller circle)

and OD $\perp$ AB

Since OAB is an isosceles triangle, OD bisects AB $\quad \frac{1}{2}$

$\therefore$ AD = DB

In Δ OAD, by phythagoras theorem

$$AD = \sqrt{OA^2 - OD^2} = \sqrt{5^2 - 3^2} = 4 \quad 1$$

AB = AD + DB = 4 + 4 = 8 cm $\quad \frac{1}{2}$ 2m

6. Given that Cos A $= \frac{12}{13}$

$$\text{Sin A} = \sqrt{1 - Cos^2 A} = \sqrt{1 - \frac{12^2}{13^2}} = \frac{5}{13} \quad \frac{1}{2}$$

$$\text{Cosec A} = \frac{1}{SinA} = \frac{13}{5} \quad \frac{1}{2}$$

$$\text{Cot A} = \frac{SinA}{CosA} = \frac{5/13}{12/13} = \frac{5}{12} \quad 1$$ 2m

7. Median $= l + \left(\frac{\frac{n}{2} - cf}{f} \right) \times h \quad 1$

Where l = lower boundary of median class

n = number of observations

cf = cumulative frequency of class preceeding the median class $\quad 1$

f = frequency of median class

h = size of the median class

2m

8. Given that $\triangle ABC \sim \triangle DEF$

and in $\triangle$ ABC, $\text{Sin} = \frac{3}{5} = \frac{\text{opposite side to } \theta}{\text{hypotenuse}}$ $\frac{1}{2}$

In $\triangle$ DEF, $\tan\theta = \frac{9}{12} = \frac{\text{opposite side to } \theta}{\text{Adjacent side to } \theta}$ $\frac{1}{2}$

$\therefore$ 3 and 9 are corresponding sides $\frac{1}{2}$

$$\therefore \frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta DEF} = \frac{3^2}{9^2} = \frac{9}{81} = \frac{1}{9}$$

$\therefore$ Ratio of areas of $\triangle$ ABC and $\triangle$ DEF $= 1 : 9$ $\frac{1}{2}$ 2m

9. Given that DE || AB in $\triangle$ ABC

and by thales theorem, $\frac{1}{2}$

$$\frac{CD}{AD} = \frac{CE}{BE}$$

$$\Rightarrow \frac{x+3}{8x+9} = \frac{x}{3x+4} \quad \frac{1}{2}$$

$\Rightarrow (x+3)(3x+4) = x(8x+9)$

$\Rightarrow 3x^2 + 13x + 12 = 8x^2 + 9x$

$\Rightarrow 5x^2 - 4x - 12 = 0$ $\frac{1}{2}$

$\Rightarrow (x-2)(5x+6) = 0$

$\Rightarrow x = 2$ or $x = -\frac{6}{5}$

Since length is non negative, $x = 2$ $\frac{1}{2}$ 2m

Section - III (Each question carries 4 marks)

10 (a) Let the vertices of the parallelogram are

A (1, 2); B (4, y); C (x, 6); D (3, 5) 1

We know that mid points of the diagonals of a parallelogram are equal

$\therefore$ Mid point of the diagonal AC = Mid point of the diagonal BD

$$\Rightarrow \left(\frac{1+x}{2}, \frac{2+6}{2}\right) = \left(\frac{4+3}{2}, \frac{y+5}{2}\right) \quad 1$$

$$\Rightarrow \frac{1+x}{2} = \frac{7}{2} \Rightarrow x = 6 \quad 1$$

and $\frac{y+5}{2} = \frac{8}{2} \Rightarrow y = 3$ $\frac{1}{2}$ 4m

10 (b)

Class	Frequency	
30 – 39	2	
40 – 49	3	
50 – 59	20	f_0
$\boxed{60 - 69 \quad 31}$	31	f_1 modal class
70 – 79	17	f_2
80-89	10	
90-99	4	

Mode = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$ } 1m

Here $l = \frac{60+59}{2} = 59.5$; $f_1 = 31$; $f_0 = 20$;

$f_2 = 17$; h = 10 } 1m

$\therefore$ Mode = $59.5 + \left(\frac{31-20}{62-20-17} \right) \times 10$ } 1m

= $59.5 + \left(\frac{11}{25} \right) \times 10$

= 59.5 + 4.4 } 1m

= 63.9 4m

11 (a) Given that OACB is a quadrant of a circle with centre 'O' and radius 3.5cm

$\therefore$ Area of the sector OACB = $\frac{x}{360^o} \times \pi r^2$

Here x = 90o; $\Pi = \frac{22}{7}$; r = 3.5

$\therefore$ Area of the sector OACB = $\frac{90^o}{360^o} \times \frac{22}{7} \times 3.5 \times 3.5$ } 1m

= $\frac{1}{2} \times 11 \times 0.5 \times 3.5$

= 9.625 cm^2 } $\frac{1}{2}$m

OBD is a right angled triangle with sides

OB = 3.5 and OD = 2 cm

Ar. of $\triangle$OBD = $\frac{1}{2} \times OB \times OD$ $\quad 1\frac{1}{2}$ m

= $\frac{1}{2} \times 3.5 \times 2$ = 3.5 cm^2

Area of shaded region = Ar. of OACB – Ar. $\triangle$OBD $\quad \frac{1}{2}$

= 9.625 – 3.5

= 6.125 cm^2 $\quad \frac{1}{2}$ $\quad$ 4m

11 (b) (i) $\frac{Sin\ 30^o + \tan\ 45^o - Co\sec\ 60^o}{Cot\ 45^o + Cos\ 60^o - Sec\ 30^o} = \frac{\frac{1}{2}+1-\frac{2}{\sqrt{3}}}{1+\frac{1}{2}-\frac{2}{\sqrt{3}}} = 1$ $\quad$ 2m

(ii) 2 tan^2 45^o + Cos^2 30^o – Sin^2 30^o = $2\,(1)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{1}{2}\right)^2$ $\quad$ 1m

$= 2 + \frac{3}{4} - \frac{1}{4} = \frac{5}{2}$ $\quad$ 1m $\quad$ 4m

12 (a) Given that A (0, 1), B (2, 1), C (0, 3) are the vertices of $\triangle$ABC

Ar. $\triangle$ABC = $\frac{1}{2}\left|\ x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\ \right|$ $\quad \frac{1}{2}$ m

Here $A\begin{pmatrix}0, & 1\\ x_1 & y_1\end{pmatrix}$; $B\begin{pmatrix}2, & 1\\ x_2 & y_2\end{pmatrix}$; $C\begin{pmatrix}0, & 3\\ x_3 & y_3\end{pmatrix}$;

Ar. $\triangle$ABC = $\frac{1}{2}\left|\ O\ (1-3) + 2\ (3-1) + 0\ (1-2)\ \right|$ $\quad$ 1m

= $\frac{1}{2}\ |4|$ = 2 sq. units

Mid point of B (2, 1); C (0, 3) is D = $\left(\frac{2+0}{2}, \frac{1+3}{2}\right)$ = (1, 2)

Mid point of C (0, 3); A (0, 1) is E = $\left(\frac{0+0}{2}, \frac{3+1}{2}\right)$ = (0, 2) $\quad$ 1m

Mid point of A (0, 1); B (2, 1) is F = $\left(\frac{0+2}{2}, \frac{1+1}{2}\right)$ = (1, 1)

Ar. of $D\begin{pmatrix}1, & 2\\ x_1 & y_1\end{pmatrix}$, $E\begin{pmatrix}0, & 2\\ x_2 & y_2\end{pmatrix}$, $F\begin{pmatrix}1, & 1\\ x_3 & y_3\end{pmatrix}$ is

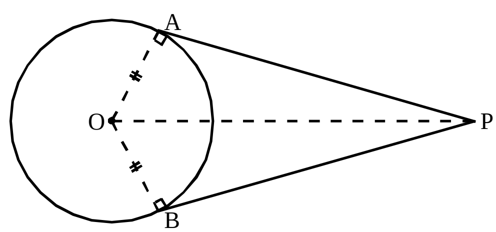
$$\text{Ar. } \Delta DEF = \frac{1}{2} \left| 1\ (2-1) + 0\ (1-2) + 1\ (2-2) \right|$$

$$= \frac{1}{2}|1| = \frac{1}{2} \text{ sq. units}$$ 1m

$\therefore$ 4 (Ar. ΔDEF) $= 4\left(\frac{1}{2}\right) = 2 =$ Ar. ΔABC $\frac{1}{2}$ 4m

12 (b) Given : A circle with Centre 'O', 'P' is a point lying outside the circle and PA and PB are two tangents to the circle from 'P'. 1m

To prove : PA = PB



Proof : Join OA, OB and OP

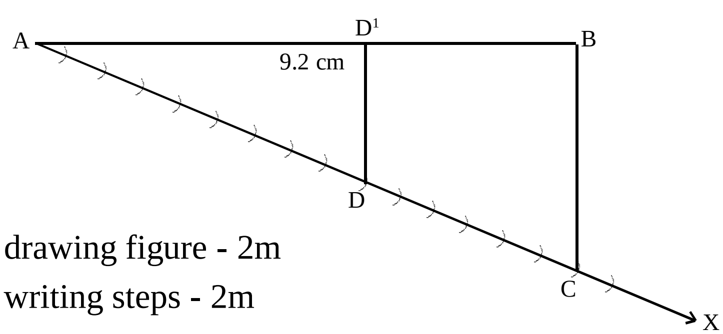
$\angle$OAP = $\angle$OBP = 90°
(Angle between radii and tangents) 1m

In ΔOAP and ΔOBP,
OA = OB (radii of same circle)
OP = OP (common) 1m

$\therefore$ ΔOAP $\cong$ ΔOBP (R.H.S. Congruency)
PA = PB 1m

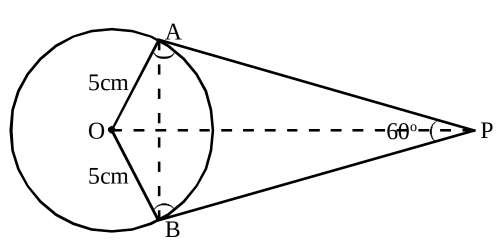
Hence proved. 4m

13 (a)



For drawing figure - 2m
For writing steps - 2m

13 (b) For drawing rough sketch - 1m
For construction - 2m
For writing steps - 1m
4m



Rough Sketch

SUMMATIVE ASSESSMENT - II - 2016 - 2017

CLASS-X - MATHS - PAPER-I

KEY

Class : X **Part - B** **Marks : 20**

III. भाषांशा:

14. C
15. B
16. A
17. A
18. C
19. D
20. C
21. D
22. A
23. C
24. A
25. A
26. C
27. B
28. A
29. A
30. A
31. D
32. B
33. D