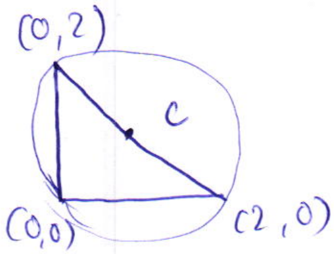
10^{th} - CBSE

PT-6M-solution

Section : A

1)



$C(x,y) = \left(\frac{2+0}{2}, \frac{0+2}{2}\right)$

$= (1,1)$

2) $\sqrt{(5\cos\theta-0)^2+(0-5\sin\theta)^2}$

$= \sqrt{25\cos^2\theta+25\sin^2\theta}$

$= \sqrt{5^2\,(1)}$ $\quad \because \sin^2\theta+\cos^2\theta=1$

$= 5$

3) If, $(p,0)$, $(0,q)$ & $(1,1)$ are collinear points

then, $\begin{matrix} p & 0 & 1 & p \\ 0 & q & 1 & 0 \end{matrix}$

$(pq+0+0)-(0+q+p)=0$

$pq = q+p$

$1 = \frac{q}{pq}+\frac{p}{pq}$

$\Rightarrow \frac{1}{p}+\frac{1}{q}=1$

4) $\frac{V_1}{V_2} = \frac{\cancel{\frac{4}{3}\pi} r_1^3}{\cancel{\frac{4}{3}\pi} r_2^3}$

$\frac{8}{27} = \left(\frac{r_1}{r_2}\right)^3 \quad \Rightarrow \frac{r_1}{r_2} = \frac{2}{3}$

$$\frac{S_1}{S_2} = \frac{4\pi r_1^2}{4\pi r_2^2}$$

$$= \left(\frac{r_1}{r_2}\right)^2$$

$$\frac{S_1}{S_2} = \left(\frac{2}{3}\right)^2$$

$$\therefore S_1 : S_2 = 4 : 9$$

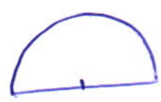
5) $l = \sqrt{h^2 + (r_1 - r_2)^2}$

6) $$\frac{\text{Vol. of cylinder}}{\text{Vol. of cone}} = \frac{\pi r^2 h}{\frac{1}{3}\pi r^2 h}$$

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

$\therefore$ Ratio $= 3:1$

Section : B



7) Perimeter of protractor $= \frac{2\pi r}{2} + 2r$

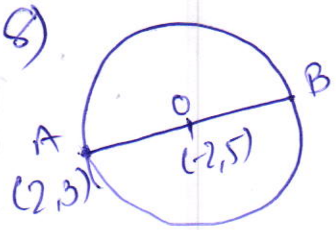
$$= \pi r + d$$

$$= \frac{22}{7} \times 7 + 14$$

$$= 22 + 14$$

$$= 36 \text{ cm.}$$

8)



Co-ordinates of B are (x, y) then,

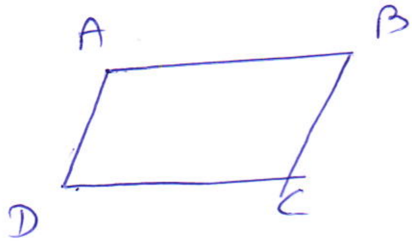
$$\frac{2+x}{2} = -2 \quad \& \quad \frac{3+y}{2} = 5$$

$$\therefore x = -6 \quad \& \quad y = 7$$

$\therefore$ The Coordinates are : $(-6, 7)$

Section : C

9) For ABCD to be a parallelogram



AB = CD & AD = BC

$\leftrightarrow$ $AB = \sqrt{2^2 + 1^2} = \sqrt{5}$

$BC = \sqrt{1^2 + 2^2} = \sqrt{5}$

$CD = \sqrt{(9-p)^2 + 1^2} = \sqrt{81 - 18p + p^2 + 1} = \sqrt{}$

$AD = \sqrt{(p-6)^2 + 2^2} = \sqrt{p^2 - 12p + 36 + 4} =$

AD = BC.

$\therefore 81 - 18p + p^2 + 1 = 5$

$p^2 - 18p + 77 = 0$

$p^2 - 7p - 11p + 77 = 0$

$(p-7)(p-11) = 0$

$p = 7$ or $p = 11.$

If we will take $p = 11$ then,

$p = 7$ because,

$AD \neq BC.$

10) $r = \frac{9}{2}$ cm. r' = radius of cylindrical wire $= 0.1$ cm

Vol. of metalic sphere = vol. of cylindrical wire

$$\frac{4}{3}\cancel{\pi} r^3 = \cancel{\pi} r'^2 h$$

$$\frac{\cancel{4}}{\cancel{3}} \times \frac{\overset{3}{\cancel{9}}}{\cancel{2}} \times \frac{9}{\cancel{2}} \times \frac{9}{2} = \frac{1}{10} \times \frac{1}{10} \times h$$

$$\therefore h = \frac{243}{2} \times 100$$

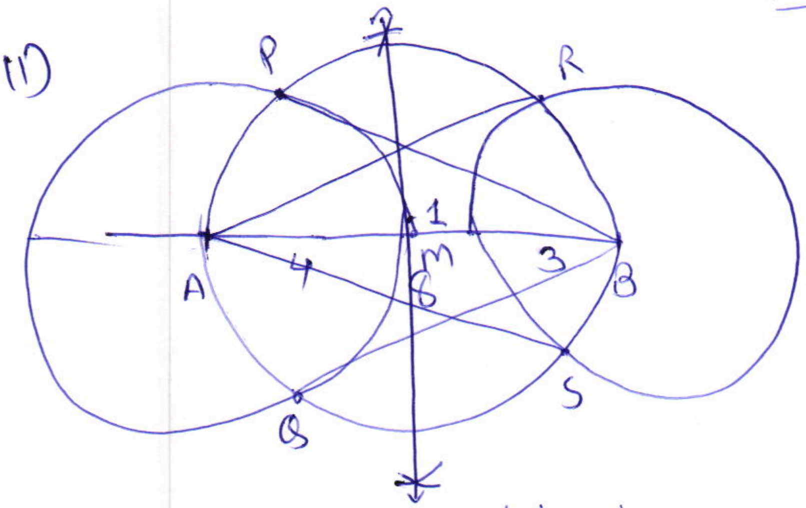
$$= \frac{24300}{2}$$

$$h = 12.150 \text{ cm}$$

$$\therefore \boxed{h = 121.50 \text{ m}}$$

$$\therefore \boxed{h = 0.12150 \text{ km}}$$

11)



$\overline{AB} = 8$ cm.
$\odot(A, 4)$, $\odot(B, 3)$

Steps of construction:

1) $\overline{AB} = 8$ cm, construct two circles $\odot(A, 4\text{cm})$ & $\odot(B, 3\text{cm})$.
2) ~~From~~ Draw the $\perp^{ar}$ bisector of $\overline{AB}$ intersecting $\overline{AB}$ at M.
3) Taking M as centre, AM = BM = 4 cm as radius, $\odot(M, 4\text{cm})$.
4) which will intersect both the previous circles in 2-2 points. Say P, Q to $\odot(A, 4)$ & R, S to $\odot(B, 3)$.