10TH - CBSE

Solution - PT-5M

Section : A

1) In ΔATO, $\angle A + \angle T + \angle O = 180^\circ$.

$90^\circ + 40^\circ + \angle AOT = 180^\circ$

$\angle AOT = 50^\circ$.

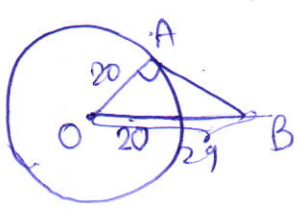
$\angle AOB = 2\angle AOT = 100^\circ$.

2) $\pi r^2 = 2\pi k$

$r = 2$ units

3) Because, the outcomes of tossing a coin are equally likely.

Section : B

4) 

In right ΔOAB,

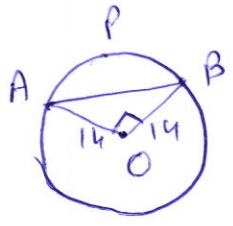
$AB^2 = OB^2 - OA^2$

$= 29^2 - 20^2$

$= 841 - 400$

$= 441$

$\therefore AB = 21$ cm

5) 

$l = \frac{\pi r \theta}{180}$

$22 = \frac{22}{7} \times 14 \times \frac{\theta}{180}$

$\theta = 90^\circ$.

$\rightarrow$ ar(ΔOAB) $= \frac{1}{2} \times 14 \times 14 = 98$ cm^2

$\rightarrow$ ar(sector OAPBO) $= \frac{\pi r^2 \theta}{360} = \frac{22}{7} \times \frac{14 \times 14 \times 90}{360}$

$= 154$ cm^2.

∴ area of segment APB = area of sector − ar(ΔOAB)

$= 154 - 98$

$= 56\ cm^2$

6) Total balls = 18

white + blue = 7

red + black = 11

not white = 18 − 5 = 13

neither white nor black = 18 − 9 = 9.

→ Probability of getting white or blue = $\frac{7}{18}$

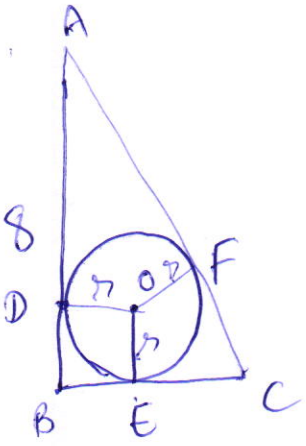
→ Probability of getting red or black = $11/18$

→ Probability of getting not white = $13/18$

→ Probability of getting neither white nor black = $\frac{9}{18} = \frac{1}{2}$

Section: C

7)



from the figure,

OD = OE = OF = r cm.

AB = 8 cm, BC = 6 cm.

Since, tangents to a circle from an external point are equal,

AF = AD = (8 − r) cm.

& CF = CE = (6 − r) cm.

∴ AC = AF + CF = 8 − r + 6 − r = 14 − 2r cm.

→ $AC^2 = AB^2 + BC^2$

$(14-2r)^2 = 8^2 + 6^2 = 10^2$

∴ $14 - 2r = \pm 10$

$\therefore r = 2$ or $r = 12$.

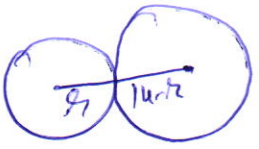
But, from figure, its clear that $\boxed{r = 2}$

8) A circle is touching the sides BC of ΔABC at P and touching AB & AC produced at Q & R resp. then, $AQ = \frac{1}{2}$ (Perimeter of ΔABC).

$\therefore s = \frac{1}{2}$ (Peri. of ΔABC).

$\therefore$ Perimeter of $\Delta ABC = 10$ cm

9) Let A & B be two centres of circles. touches each other externally.



Sum of the areas $= \pi r^2 + \pi(14-r)^2$

$130\pi = \pi(r^2 + (14-r)^2)$

$\therefore r^2 + r^2 - 28r + 196 = 260$

$\therefore 2r^2 - 28r + 66 = 0$

$\therefore (r-11)(r-3) = 0$

$\therefore r = 11$ or $r = 3$.

$\therefore 14 - r = 3$ | $14 - r = 11$.

$\therefore$ The radii of the circles will be 3 & 11 cm.

$\because$ Angle in semi-circle.

10) $\angle RPQ = 90^\circ$.

In right ΔRPQ,

$RQ^2 = PR^2 + PQ^2$

$= 24^2 + 7^2$

$= 625$

$\therefore RQ = 25$.

$\therefore r = OQ = \frac{RQ}{2} = \frac{25}{2}$ cm.

→ Area of shaded region.

= Area of semi-circle − Area of ΔRPQ.

$= \frac{1}{2} \times 7 \times \left(\frac{25}{2}\right)^2 - \frac{1}{2} \times 24 \times 7$

$= \frac{1}{2} \times \frac{22}{7} \times \frac{25}{2} \times \frac{25}{2} - \frac{1}{2} \times 24 \times 7$

$= \frac{6875}{28} - 84$

$= 245.54 - 84$

$= 161.54 cm^2$

ii) The chances of the helicopter crashing anywhere in the rectangular region is equally likely.

→ Let, E be the event of helicopter crashing in the lake.

∴ Area of entire region in which plane can crash $= 9 \times 4.5$

$= 40.5 km^2$

The area of lake within $= 3 \times 2.5$

$= 7.5 km^2$

→ ∴ Probability of helicopter crashing in lake $= P(E) = \frac{7.5}{40.5} = \frac{5}{27}$