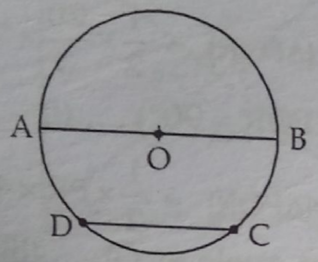
$$PQ = \frac{16}{3} \text{ cm}$$

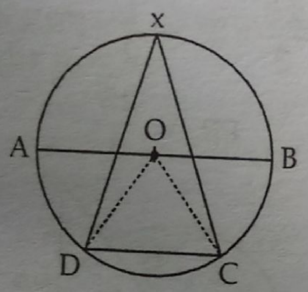
In ΔOQR

$$(QR)^2 = (OR)^2 - (OQ)^2$$
$$= (5)^2 - (D)^2 = 25 - 16$$
$$= 9$$
$$QR = 3 \text{ cm}$$
$$PR = PQ + QR = \frac{16}{3} + 3$$
$$= \frac{25}{3} \text{ cm}$$

26. (A) DC is the chord of the circle and DC = AO = OB (given)



Now draw DO & CO (Radius)



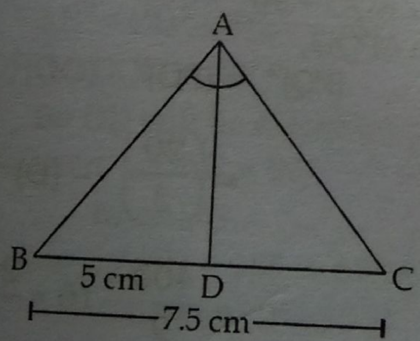
So ΔODC is a equilateral triangle

$$\angle DOC = 60°$$

then $\angle DXC = \frac{60}{2} = 30°$

(Angle of major segment of the circle)

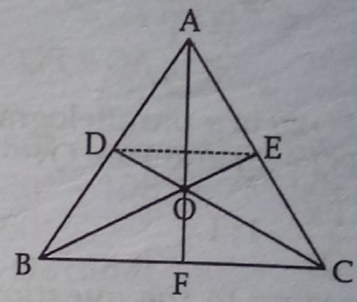
27. (A) DC = 7.5 – 5 = 2.5 cm



So $\frac{AB}{BD} = \frac{AC}{DC}$ (by angle bisector theorem)

$$\frac{AB}{AC} = \frac{5}{2.5}$$
$$\frac{AB}{AC} = \frac{2}{1}$$
$$AB : AC = 2 : 1$$

28. (C) Medians of a triangle meet or cut each other in ratio of 2 : 1



So BO = $2x$

& OE = x

$$\text{area of } \Delta ABC = \frac{1}{2} BC \times 3x$$
$$\Delta BOC = \frac{1}{2} \times BC \times x$$
$$\Delta ABC : \Delta BOC = 3 : 1$$

Now ΔDOE and ΔBOC

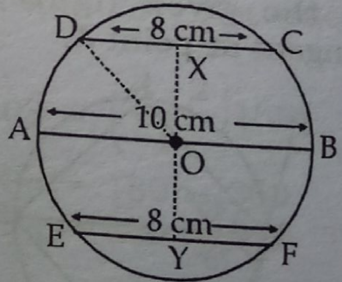
Both triangle are similar (A–A–A)

So, $\frac{\Delta DOE}{\Delta BOC} = \frac{x^2}{(2x)^2} = \frac{1}{4}$

So, $\Delta ABC : \Delta ODE = 1 : 4 \times 3$

$\Delta ABC : \Delta ODC = 1 : 12$

29. (A)



Distance between the parallel chords

$$= XY = XO + OY$$

$XO = OY =$ (equal chords are equidistance from the centre)

$$Dx = Ey = \frac{8}{2} = 4 \text{ cm}$$

OD is radius

then In ΔODx

$$OD^2 = Ox^2 + Dx^2$$

$$(5)^2 = Ox^2 + (D)^2$$

$$\Rightarrow \quad Ox^2 = 9$$

$$Ox = 3 \text{ then } xy = 3 + 3 = 6 \text{ cm.}$$

30. (B)

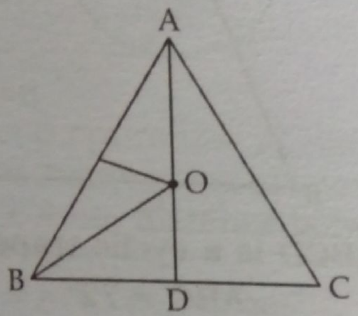
$$AP : PB = 1 : 2$$

$$\text{If } AQ = 3 \text{ cm}$$

$$\text{then } PC = 3 \times 2 = 6 \text{ cm}$$

$$AC = 3 + 6 = 9 \text{ cm.}$$

31. (D)



O is the In centre of the triangle ABC

In radius OD = 3 cm

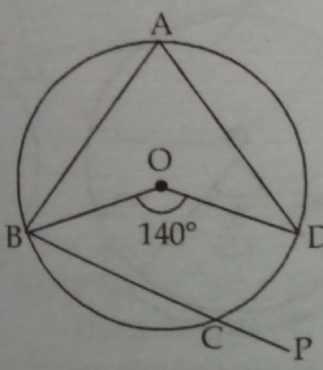
AD is the median of the equilateral triangle

AD = AO + OD (AO = 2OD by property)

= 3OD = 3 × 3

AD = 9 cm

32. (A)



$$\angle BAD = \frac{\angle BOD}{2} = \frac{140}{2} = 70°$$

ABCD is a cyclic quadrilateral

So

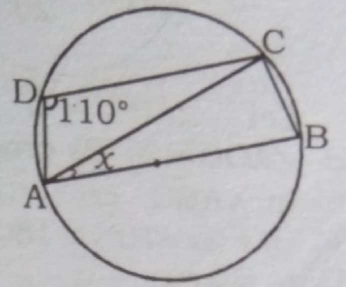
$$\angle BAD + \angle BCD = 180° \text{ (by property)}$$

$$70° + \angle BCD = 180°$$

$$\angle BCD = 110°$$

$\angle BAD = 70°$ and $\angle BCD = 110°$

33. (C)



If AB is diameter of the circle then $\angle ACB = 90°$ and ABCD is a cyclic quadrilateral

then $\angle ADC + \angle ABC = 180°$

$$\angle ABC = 70°$$

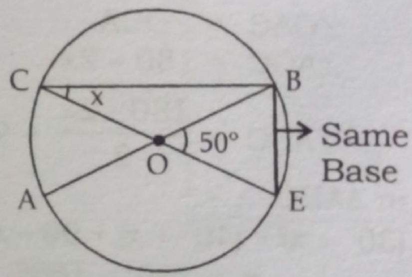
In ΔABC

$$\angle ABC + \angle ACB + x = 180°$$

$$x = 180° - (90 + 70)$$

$$x = 20°$$

34. (B)



$\angle BOE = 50°$ (at centre)

$$\angle BCE = \frac{50°}{2}$$

(from same base at circumference)

$= 25°$

Another Method:

Given $\angle BOE = 50°$

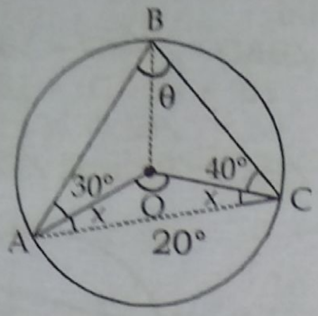
CE is diameter then

$$\angle COB = 180 - 50 = 130°$$

OC and OB are radius

then, $\angle OCB = \angle OBC = \frac{50}{2} = 25°$

35. (B)



Let $\angle ABC = \theta$

$\Rightarrow \angle AOC = 2\theta$ (By property)

In $\triangle ABC$

$\theta + 2x + 70^\circ = 180^\circ$ ...(i)

In $\triangle AOC$

$2\theta + 2x = 180^\circ$ ...(ii)

from (i) & (ii)

$\theta + 70^\circ = 2\theta$

$70^\circ = \theta$

$\Rightarrow \angle AOC = 2\theta$

$= 2 \times 70 = 140^\circ$

Another Method:

Draw chord AC

AO = OC (Radius of the circle)

So,

$\angle OAC = \angle OCA$

$\Rightarrow \angle AOC = 180 - 2x$

$\Rightarrow \angle ABC = \dfrac{180 - 2x}{2} = 90 - x^\circ$

in $\triangle ABC$

$\Rightarrow (30^\circ + x) + (40^\circ + x) + 90 - x^\circ = 180^\circ$

$x = 180^\circ - 160^\circ$

$x = 20^\circ$

$\Rightarrow \angle AOC = 180 - 2x$

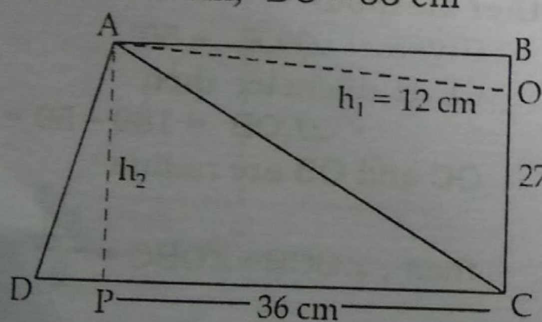
$= 180 - 2 \times 20$

$= 180 - 40$

$\angle AOC = 140$

36. (D) BC and CD are the adjacent sides.

BC = 27 cm, DC = 36 cm



Now Area of $\triangle ADC$

$= \dfrac{1}{2} \times 36 \times h_2$ ...(A)

& Area of $\triangle ABC$

$= \dfrac{1}{2} \times 27 \times 12$ ...(B)

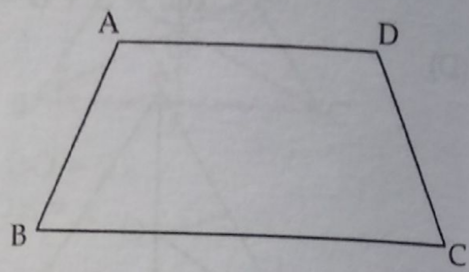
Now Area of Parallelogram

$2 \times \triangle ADC = 2 \times \triangle ABC$ (Area)

So, $2 \times \dfrac{1}{2} \times 36 \times h_2 = 2 \times \dfrac{1}{2} \times 27 \times 12$

$h_2 = \dfrac{27 \times 12}{2 \times 18} = 9$ cm

37. (D)



ABCD is a cyclic trapezium

$\angle ABC = 72^\circ$

So, $\angle ADC = 180^\circ - 72^\circ = 108^\circ$

$\angle ADC$ & $\angle DCB$ or ($\angle BCD$) are adjacent angles ($\because AD \parallel BC$)

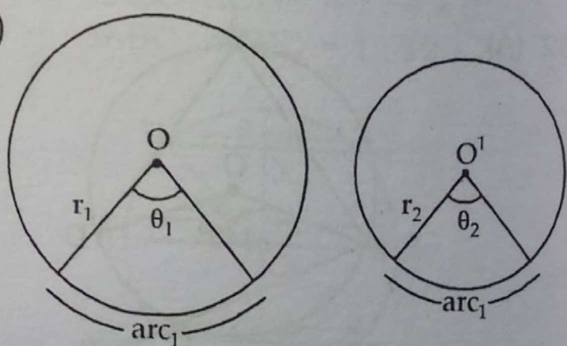
So,

$\angle ADC + \angle BCD = 180^\circ$

$\Rightarrow \angle BCD = 180^\circ - 108^\circ$

$= 72^\circ$

38. (B)



radius of the first circle is r_1 and second circle is r_2.

$arc_1 = arc_2$ (given)

$\theta_1 = 60^\circ$ and $\theta_2 = 75^\circ$

(given)

$$arc_1 = 2\pi r_1 \times \frac{\theta_1}{360°} = 2\pi r_1 \times \frac{60°}{360°}$$

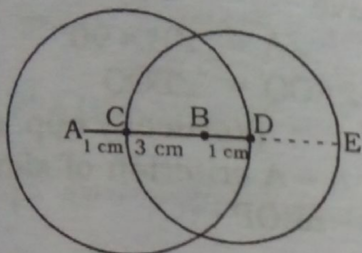
$$arc_2 = 2\pi r_2 \times \frac{\theta_2}{360°} = 2\pi r_2 \times \frac{75°}{360°}$$

$arc_1 = arc_2$

$$\Rightarrow 2\pi r_1 \times \frac{60}{360°} = 2\pi r_2 \times \frac{75}{360°}$$

$$\frac{r_1}{r_2} = \frac{5}{4}$$

39. (B)



Given

$\because$ AD = 5 cm radius of circle

BC = 3 cm radius of another circle

AB = 4 cm distance between two centres

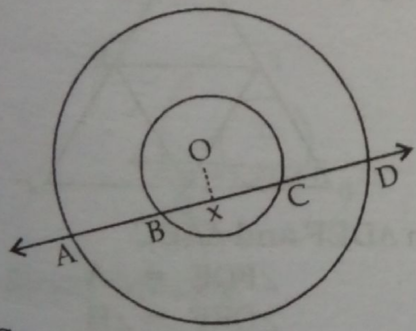
$\therefore$ AC = AB – BC = 1cm

BD = AD – AB = 5 – 4 = 1cm

$\therefore$ Common line segment

CD = BC + BD = 3cm + 1cm = 4cm

40. (D) Draw a perpendicular on AD at x



So,

$$AD = AB + Bx + xC + CD$$

And $Ax = xD$

$$AB + Bx = xC + CD \quad (Bx = xC)$$

then AB = CD

41. (D) Since the diagonals of a trapezium divide each other proportionally, therefore

$$\frac{AO}{OC} = \frac{BO}{OD}$$

$$\Rightarrow \frac{3x-19}{x-5} = \frac{x-3}{3}$$

$$\Rightarrow 3(3x-19) = (x-5)(x-3)$$

$$\Rightarrow x^2 - 17x + 72 = 0$$

$$\Rightarrow (x-8)(x-9) = 0$$

$$\Rightarrow x = 8 \text{ or } x = 9$$

42. (B) We have $\Delta ACB \sim \Delta APQ$

$$\Rightarrow \frac{AC}{AP} = \frac{CB}{PQ} = \frac{AB}{AQ}$$

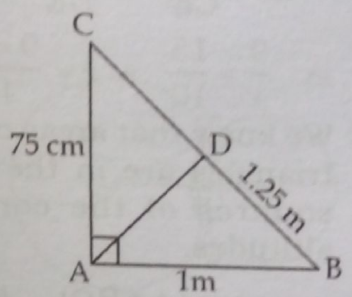
$$\Rightarrow \frac{AC}{AP} = \frac{CB}{PQ} \text{ and } \frac{CB}{PQ} = \frac{AB}{AQ}$$

$$\Rightarrow \frac{AC}{2.8} = \frac{8}{4} \text{ and } \frac{8}{4} = \frac{6.5}{AQ}$$

$$\Rightarrow AC = 2 \times 2.8 = 5.6 \text{ cm}$$

$$\Rightarrow AQ = \frac{6.5}{2} = 3.25 \text{ cm}$$

43. (D);



We have AB = 100 cm, AC = 75 cm and BD = 125 cm

In ΔBAC and ΔBDA,

We have

$\angle BAC = \angle BDA$ (Each equal to 90°)

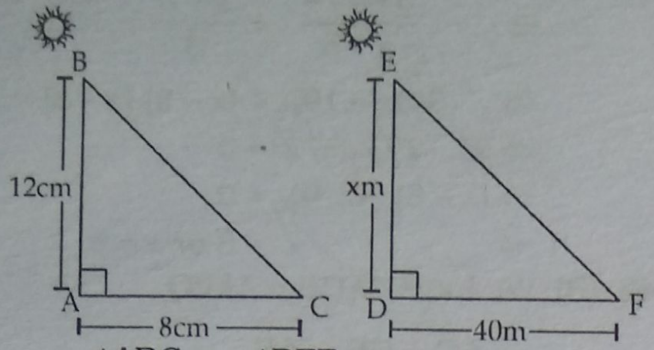
and $\angle B = \angle B$

So, by AA (Angle–Angle) criterion of Similarity, $\Delta BAC \sim \Delta BDA$

$$\Rightarrow \frac{BA}{BD} = \frac{AC}{AD} \Rightarrow \frac{100}{125} = \frac{75}{AD}$$

$$\Rightarrow AD = \frac{125 \times 75}{100} = 93.75 \text{ cm}$$

44. (C)



$\Delta ABC \sim \Delta DEF$

SO,

$$\Rightarrow \frac{AB}{DE} = \frac{AC}{DF} \qquad \Rightarrow \frac{12}{x} = \frac{8}{40}$$

$$\Rightarrow x = \frac{12 \times 40}{8} = 60\,m$$

45. (B) In ΔCAB and ΔCED

We have,

$$\angle A = \angle CED \text{ and } \angle C = \angle C$$

$$\Delta CAB \sim \Delta CED$$

$$\frac{CA}{CE} = \frac{AB}{DE}$$

$$\Rightarrow \frac{9}{x} = \frac{15}{10} = x = \frac{9 \times 10}{15} = 6$$

46. (A) We know that areas of two similar triangles are in the ratio of the squares of the corresponding altitudes.

$$\therefore \frac{\text{area}(\Delta ABC)}{\text{area}(\Delta PQR)} = \frac{AD^2}{PS^2}$$

$$\therefore \frac{\text{area}(\Delta ABC)}{\text{area}(\Delta PQR)} = \left(\frac{4}{9}\right)^2 = \frac{16}{81}$$

$= 16 : 81$

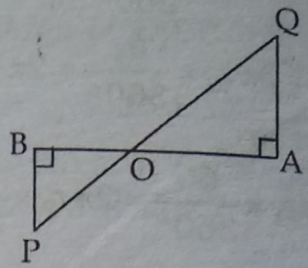
47. (C) Since the ratio of areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides. therefore,

$$\frac{\text{area}(\Delta ABC)}{\text{area}(\Delta DEF)} = \frac{BC^2}{EF^2}$$

$$\Rightarrow \frac{54}{\text{area}(\Delta DEF)} = \frac{3^2}{4^2}$$

$$\Rightarrow \text{area}(\Delta DEF) = \frac{54 \times 16}{9} = 96\text{ cm}^2$$

48. (C)



In ΔOAQ and ΔOBP,

We have

$$\angle A = \angle B = 90°$$

$$\angle AOQ = \angle BOQ$$

(Vertically opp. angles)

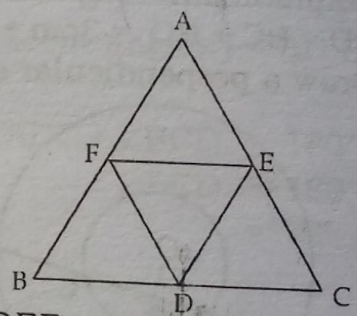
So by A – A criterion of similarity $\Delta AOQ \sim \Delta BOP$

$$\Rightarrow \frac{\text{area}(\Delta AOQ)}{\text{area}(\Delta BOP)} = \frac{OQ^2}{OP^2}$$

$$= \frac{\text{Area}(\Delta AOQ)}{150} = \frac{7^2}{5^2}$$

$$\Rightarrow \text{area}(\Delta AOQ) = \frac{49}{25} \times 150 = 294\text{ cm}^2$$

49. (A);



In ΔDEF and ΔABC

$$\angle FDE = \angle A$$

$$\angle DEF = \angle B$$

(Both are the opposite Angles of parallelogram AFDE and BDEF)

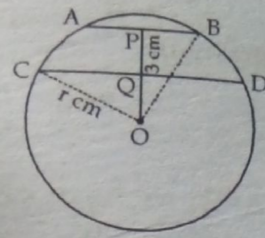
So by A–A similarity criterion

$$\Rightarrow \frac{\text{area}(\Delta DEF)}{\text{area}(\Delta ABC)} = \frac{DE^2}{AB^2}$$

$$= \frac{\left(\frac{1}{2}AB\right)^2}{AB^2}\left(\because DE = \frac{1}{2}AB\right)$$

$\Rightarrow$ area (ΔDEF) : area $(\Delta ABC) = 1 : 4$

50. (D)



In right triangles OAP and OCQ

We have, PQ = 3 cm

Let OQ $= x$ cm

So, OP $= (x+3)$

$\Rightarrow \quad (OA)^2 = (OP)^2 + AP^2$

$\& \ OC^2 = OQ^2 + CQ^2$

$r^2 = (x+3)^2 + 3^2$ and $r^2 = x^2 + 6^2$

$(\because AP = \frac{1}{2}AB = 3$ cm and CQ

$= \frac{1}{2}CD = 6$ cm)

$\Rightarrow \quad (x+3)^2 + 3^2 = x^2 + 6^2$

$\Rightarrow x^2 + 6x + 9 + 9 = x^2 + 36$

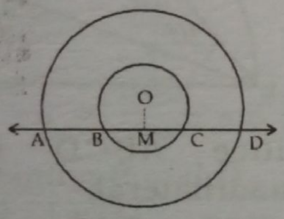
$6x = 18$

$\Rightarrow \quad x = 3$ cm

Now $\quad r^2 = 3^2 + 6^2$

$r = \sqrt{45} = 6.7$ cm

51. (B)



Since OM⊥BC

$BM = CM = \frac{1}{2}BC = 4$ cm

Similarly, OM⊥AD

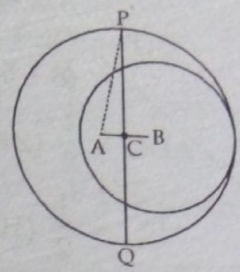
$\Rightarrow \quad AM = DM = \frac{1}{2}AD = 6$ cm

So, $\quad AB = 6 - 4 = 2$ cm

$BD = BC + CD = (8 + 2)$

$= 10$ cm.

52. (B)



If two circles touch internally then distance between their centre is equal to the difference of radii = (5 – 3) = 2 cm.

PQ is $\perp^r$ bisector of AB which is 2 cm. then AC = CB = 1 cm.

from right angle triangle ACP, we have

$AP^2 = AC^2 + CP^2$

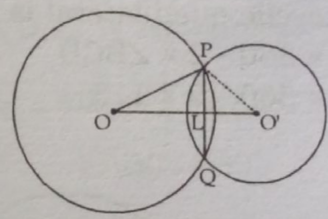
$5^2 = 1^2 + CP^2$

$CP^2 = 25 - 1 = 24$

$\Rightarrow \quad CP = \sqrt{24}$

Hence $PQ = 2CP = 2\sqrt{24} = 4\sqrt{6}$ cm.

53. (C)



Let O and O' be the centre of the circle of radii 10 cm and 8 cm and PQ = 12 cm.

$\Rightarrow \quad PL = \frac{1}{2}PQ = 6$ cm

In right triangle OLP, we have

$OP^2 = OL^2 + LP^2$

$\Rightarrow \quad OL = \sqrt{(10)^2 - (6)^2} = \sqrt{64} =$ 8 cm and In right triangle O'LP, we have

$\Rightarrow O'L^2 + LP^2 = O'P^2$

$\Rightarrow \quad O'L = \sqrt{8^2 - 6^2} = \sqrt{28}$

$= 5.29$ cm

$\Rightarrow \quad OO' = OL + LQ'$

$= (8 + 5.29) = 13.29$ cm

54. (B) $\therefore \quad \angle ADC = \frac{1}{2}(\angle AOC)$

$= \frac{1}{2}(100°) = 50°$

and $\angle ABC = \frac{1}{2}$ (reflexive AOC)

$= \frac{1}{2}(360° - 100°)$

$= \frac{1}{2} \times 260°$

$\angle ABC = 130°$

Shortcut – $\angle ADC = \frac{1}{2}$

Property – Angle on the centre is twice the angle on circumference made on same base.

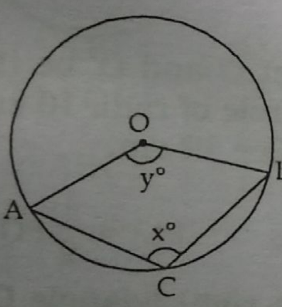
$\angle ABC = 180 - \angle ADC$

Property:– Sum of opp. angles of a cyclic quadilateral is 180°

$= 360 - 2 \times \angle BCD$

$= 360 - 2 \times 115$

55. (C)



Clearly, major arc AB subtends $x°$ at a point on the remaining part of the circle.

reflex $\quad \angle AOB = 2x°$

$\Rightarrow \quad 360° - y = 2x°$

$\Rightarrow \quad y = 360° - 2x° \quad ...(i)$

If ACBO is a parallelogram, then

$\Rightarrow \quad x° = y° \quad ...(ii)$

Put *(ii)* in *(i)*

$\Rightarrow \quad x = \frac{360°}{3} = 120°$

56. (D) In Δ APB, we have $\angle PAB = 40°$

& $\quad \angle APB = 90°$

$\Rightarrow \quad \angle ABP = 50°$

Now arc AP makes $\angle ABP$ and $\angle ACP$ in the same segment so they are equal.

$\Rightarrow \angle ACP = \angle ABP = 50°$

57. (D) We have:

$\angle ACB = \frac{1}{2}\angle AOB = 65°$

$\therefore \quad \angle DCB = 180° - \angle ACB$

$= 180° - 65° = 115°$

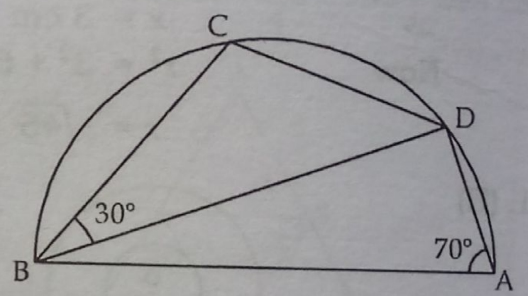
Now, reflex $\angle BO'D$

$= 360 - 2\angle BCD$

$= 360 - 2 \times 115°$

$\Rightarrow \quad x = 360° - 230° = 130°$

58. (A)



Since ABCD is a cyclic quadrilateral

$\angle BCD + \angle BAD = 180°$

$\angle BCD + 70° = 180°$

$\angle BCD = 110°$

In ΔBCD, we have

$\angle CBD + \angle BCD + \angle BDC = 180°$

$\Rightarrow \quad 30° + 110° + \angle BDC = 180°$

$\angle BDC = 40°$

In ΔABD,

$\angle ABD = 180° - (90° + 70°)$

$\angle ABD = 20°$

Shortcut –

$\angle BDA = 90^\circ$, $\angle BAD = 70^\circ$ (given)

$\Rightarrow \angle ABD = 90^\circ - 70^\circ = 20^\circ$

Property – any angle made on circumference of a semi-circle , diametre as base is 90°.

59. (A) ABCD is a cyclic quadrilateral.

$\Rightarrow 50^\circ + y^\circ = 180^\circ$

$\Rightarrow y = 130^\circ$

Clearly, ΔOAB is an isosceles Triangle with OA = OB (radius)

$\Rightarrow$ So $\angle OBA = \angle OAB = 50^\circ$

Thus, $\angle AOB = 180^\circ - (50^\circ + 50^\circ) = 80^\circ$

Hence, $x = 180^\circ - 80^\circ = 100^\circ$

$(x, y) = (100^\circ, 130^\circ)$

60. (D) In ΔABC

$$\angle B = 180^\circ - (60^\circ + 20^\circ) = 100^\circ$$

In cyclic quadrilateral ABCD

$$\angle B + \angle D = 180^\circ$$

$$\angle D = \angle ADC = 180^\circ - 100^\circ = 80^\circ$$

61. (B) We know that:

$$\text{Each exterior angle} = \frac{360^\circ}{n}$$

$$72^\circ = \frac{360^\circ}{n}$$

$$n = \frac{360^\circ}{72^\circ} = 5 \quad \boxed{n = 5}$$

62. (C) After joining B and D and AB || CD

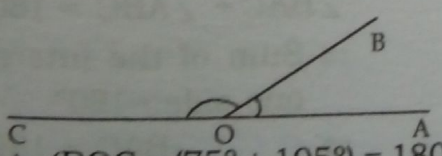
$$\angle ABD + \angle CDB = 180^\circ$$

$$\angle OBD + \angle ODB + \angle BOD = 180^\circ$$

Adding $\angle ABO + CDO + \gamma = 360^\circ$

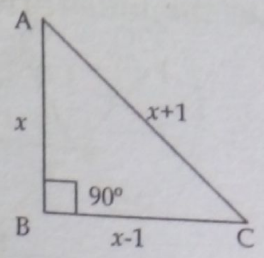
$$= \boxed{\alpha + \beta + \gamma = 360^\circ}$$

63. (C)



$\angle AOB + \angle BOC = (75^\circ + 105^\circ) = 180^\circ$

64. (A)



by pythagorus theorem:

$$(x+1)^2 = x^2 + (x+1)^2$$

$$\Rightarrow x^2 + 2x + 1 = x^2 + x^2 - 2x + 1$$

$$\Rightarrow x^2 - 4x = 0$$

$$\Rightarrow x(x-4) = 0$$

$$\Rightarrow x = 4, x \neq 0$$

So, $\boxed{x + 1 = 4 + 1 = 5}$

65. (B) $\therefore$ AD || BC

So,

$$\angle C + \angle D = 180^\circ$$

$$\Rightarrow \angle AOB = \frac{1}{2}(\angle C + \angle D)$$

$$= \frac{1}{2} \times 180^\circ = 90^\circ$$

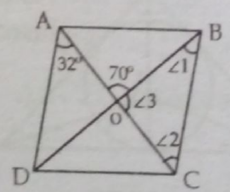
66. (C) $\because$ OA = AC = OC

$\therefore \Delta OAC$ is equilateral triangle.

So, $\angle ABC = \frac{1}{2} \times \angle AOC = \frac{1}{2} \times 60^\circ$

$\angle ABC = 30^\circ$

67. (C)



$\angle BOC = \angle 3$

$$\angle 3 = 180^\circ - \angle AOB = 180^\circ - 70^\circ = 110^\circ$$

$\angle DAC = \angle 2 = 32^\circ$ (Alternate angles as AD □BC)

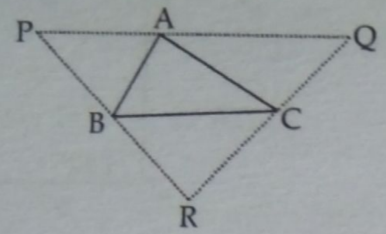
$\therefore$ In ΔOBC

$$\angle 3 + \angle 2 + \angle 1 = 180^\circ$$

$$\angle 1 = 180^\circ - 110^\circ - 32^\circ = 38^\circ$$

$\therefore \angle 1 = \angle DBC = 38^\circ$

68. (C) Let the initial triangle is ABC



New triangle PQR.

then, PQ = 2BC

QR = 2AB

RP = 2AC

$\therefore$

$$\frac{\Delta PQR\text{'s perimeter}}{\Delta ABC\text{'s perimeter}} = \frac{PQ+QR+RP}{AB+BC+AC}$$

$\boxed{\Delta PQR : \Delta ABC = 2:1}$

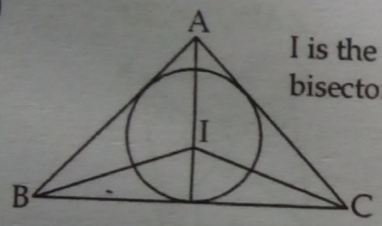
69. (A) $\Delta_1 = \frac{1}{2} bh\Delta$

$\Delta_1 = \frac{1}{2} \times \left(\frac{b}{2}\right) \times \frac{h}{2}$

$\therefore \quad \frac{\Delta_1}{\Delta_2} = \frac{1/2\, bh}{\frac{1}{2} \times \frac{1}{4} bh} \setminus 4:1$

$\boxed{\Delta_1 : \Delta_2 = 4:1}$

70. (C)



I is the internal bisector

$\angle BIC = 135°$

$\therefore \quad \frac{1}{2}(\angle B + \angle C) = 45°$

$\Rightarrow \angle B + \angle C = 90°$

$\therefore \quad \boxed{\angle A = 90°}$

71. (B) In $\Delta ABC \Rightarrow AC = BC$

$\Rightarrow \quad \angle CBA = \angle BAC = 38°$

and $\angle ACD = \angle CBA + \angle BAC$

$= 38° + 38° = 76°$

In $\Delta ACD \quad AD = CD$

$\angle DCA = \angle CAD = 76°$

and $\angle DCA + \angle CAD + \angle ADC = 180°$

$\Rightarrow 76° + 76° + \angle ADC = 180°$

$\boxed{\angle ADC = 28°}$

72. (B) Area of ΔPQR

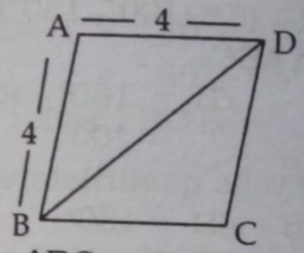
= Area of ΔPLM + Area of LMRQ

= $3(\Delta PLM)$ (given)

$\Rightarrow \frac{\text{Area of } \Delta PLM}{\text{Area of } \Delta PQR} = \frac{1}{3}$

$\Rightarrow \frac{(PL)^2}{(PQ)^2} = \frac{1}{3} \Rightarrow \frac{PL}{PQ} = \frac{1}{\sqrt{3}}$

73. (D)



$\angle ABC = 120°$

$\angle ABD = \frac{120°}{2} = 60°$

$\Rightarrow$ Diagonals bisect the angles.

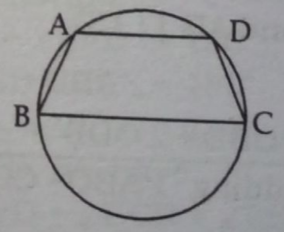
So, $\angle ABD = \angle ADB = 60°$

$= AB = AD$

$\therefore$ ΔABD is a equilateral triangle.

So, $\boxed{BD = 4 \text{ cm}}$

74. (D)



$\angle ABC = 72°$

$\angle BAC + \angle ABC = 180°$

$\Rightarrow$ Sum of the internal angles of one side $=180°$

$\Rightarrow \quad \angle BAC = 180° - 72°$

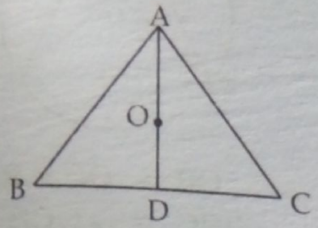
$= 108°$

So,

$$\angle C = 180° - 108 = 72°$$

(cyclic property)

75. (D)



$$\frac{AO}{OD} = \frac{2}{1}$$

$$\Rightarrow \frac{AD}{OD} = \frac{3}{1}$$

$$\Rightarrow AD = 3 \times OD$$

$$= 3 \times 3 = 9 \text{ cm}$$

76. (B) Perimeter of ABCDEFGHIJKLMNA

= AB + BCD + DE + EF + FGH + HI+ IJK + KL + LM + MNA

$$\Rightarrow (8-1-1)+\frac{3}{4}(2\pi.1)+(2+2)+\frac{3}{4}(2\pi.1)$$

$$+(8-1-1)+\frac{3}{4}(2\pi.1)+(2+2)+\frac{3}{4}(2\pi.1)$$

$$\Rightarrow 2\times6+4\times\frac{3}{4}(2\pi.1)+8$$

$$\Rightarrow 12 + 8 + 18.84$$

$$\Rightarrow 38.84 \text{ cm.}$$

77. (A) $\because$ PR || AB and PQ || BC

$\therefore$ PCBA is a perallelogram

So,

ACRB and CBQA also parallelogram

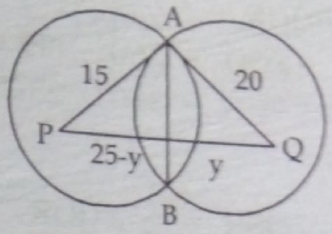
$\therefore$ CA = RB and CA = BQ

$$\therefore AC = \frac{1}{2}QR$$

78. (A) Given AP = 15 cm

AQ = 20 cm

& PQ = 25 cm



In ΔAPO

$\Rightarrow AO^2 = (15)^2 - (25-y)^2$ ...(i)

and in AQO

$\Rightarrow AO^2 = (20)^2 - y^2$ ... (ii)

From (i) and (ii)

$225 - 625 - y^2 + 50y = 400 - y^2$

here, $y = 16$

then, $AO^2 = (15)^2 - (25-16)^2$

$= 144$

$AO^2 = 144$ cm

AO = 12 cm

So,Length of the chord

= 12 × 2 = 24 cm

79. (B) AO = 6.5 (radius)

AB = 13 cm

(diameter)

and $\angle$ACB = 90°

(Angle at circumference)

AC = 5 cm

So, $(CB)^2 = (13)^2 - (5)^2$

= 144.

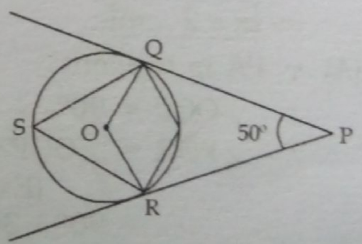
CB = 12 cm

Area of ΔACB = (Area of Δ ACB)

$$= \frac{1}{2} \times 5 \times 12$$

$$= 30 \text{ cm}^2$$

80. (B)



$\angle$PQO and $\angle$PRO = 90° (Tangents) in PQOR

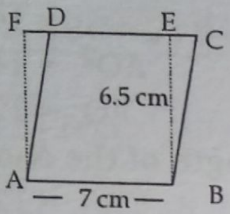
$$\angle ROQ = 360° - (90 + 90 + 50°)$$
$$= 360° - 230° = 130°$$

So,

$$\angle QSR = \frac{1}{2} \angle QOR$$
$$= \angle \frac{1}{2} \times 130° = 65°$$

(Angle subtended by same chord at the centre is twice of at the circumference).

81. (C) Area of the rectangle ABEF = 7×6.5 = $45.5\ cm^2$



So, Area of parallelogram ABCD = Area of rectangle because parallelogram is situated on the same height & base of rectangle.

82. (B) $\angle PAQ + 20 + 120 = 180°$

$\therefore \quad \angle PAQ = 180° - 140°$
$= 40°$

So, $\quad \angle PAQ = 40°$

83. (D) Let the length of the chord = x cm

$\therefore$ CP × DP = AP × BP

$\Rightarrow (4 + x) \times 4 = (5 + 3) \times 3$

$\Rightarrow 4 + x = \frac{8 \times 3}{4} \Rightarrow 4 \times x = 6$

$\Rightarrow \boxed{x = 2\ cm}$

84. (A) $\because$ PA is tangent

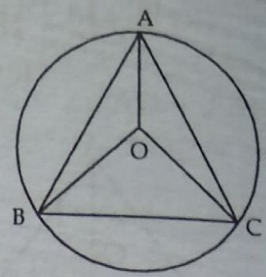
$\therefore \quad \angle OQP = 90°$

$\therefore \quad \angle POR = \angle OQP + \angle QPO$ (Exterior angles)

$= 90° + 35°$

$\boxed{\angle POR = 125°}$

85. (A)



OB = OC = Radius

$\angle OBC = \angle OCB = 35°$

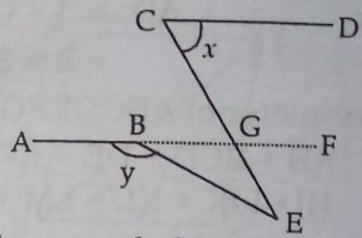
$\therefore \quad \angle BOC = 180 - 70 = 110°$

So,

$\angle BAC = \frac{1}{2} \times 110°$

$= 55°$ (by property)

86. (D)



AB is extended to F.

$\because$ CD || GF

$\Rightarrow \quad \angle FGE = \angle DCG = x$

$\Rightarrow \quad \angle BGE = 180° - \angle FGE$
$= 180° - x$

$\& \angle GBE = 180° - \angle ABE$
$= 180° - y$

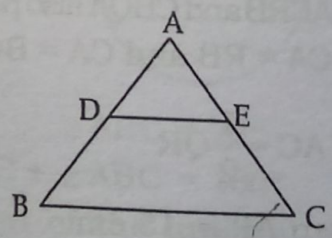
and in $\triangle$BGE

$\angle BGE + \angle GBE + \angle BEG = 180°$

$\Rightarrow 180° - x + \angle 180° - y + \angle BEG = 180°$

$\Rightarrow \angle BEG = x + y - 180°$ or $x + y - \pi$

87. (D) Given

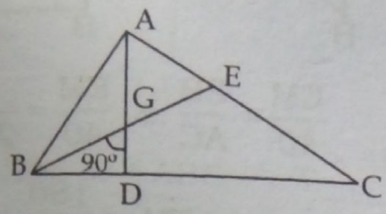


$\frac{AD}{AB} = \frac{1}{3} \Rightarrow \frac{AD}{BD} = \frac{1}{2} \Rightarrow \frac{AE}{AC} = \frac{1}{3}$

$\frac{AE}{CE} = \frac{1}{2}$ $\therefore$ DE || BC

So, $DE = \frac{1}{3} \times BC = \frac{1}{3} \times 15 = 5$ cm

88. (C)



$AD = 9$ cm

$\Rightarrow \quad GD = \frac{1}{3} \times 9 = 3$ cm

$BE = 6$ cm

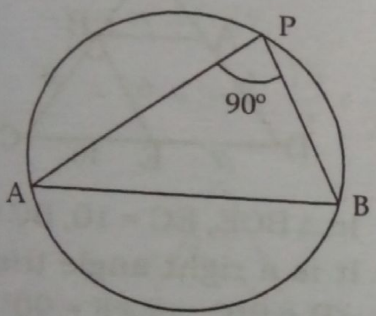
$BG = \frac{2}{3} \times 6 = 4$ cm

So,

$BD = \sqrt{4^2 + 3^2} = \sqrt{25}$

$= 5$ cm

89. (C) Locus of point P will be the Circumference of circle having diameter AB



90. (B) When a transversal intersects two parallel lines then summation of one side angles will be 180°

So, $\angle B + \angle C = 180°$

$\Rightarrow \quad \angle C = 180° - \angle B$

$\angle C = 180° - 90°$

$= 90°$

In AECD

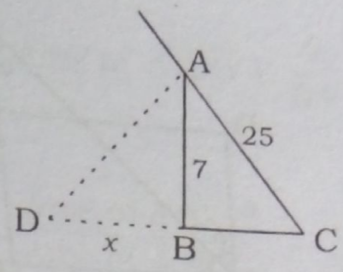
$\angle DAE + \angle AEC + \angle DCE + \angle ADC = 360°$

$\Rightarrow 90° + 120° + 90° + \angle ADC = 360°$

$\angle ADC = (360° - 300°)$

$\boxed{\angle ADC = 60°}$

91. (A)



Let BD = x

$\frac{AC}{AB} = \frac{CD}{BD}$

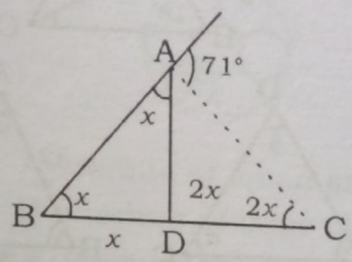
(Property of external bisector)

$\frac{25}{7} = \frac{24 + x}{x}$

$25x = 24 \times 7 + 7x$

$x = \frac{28}{3}$ cm

92. (A)



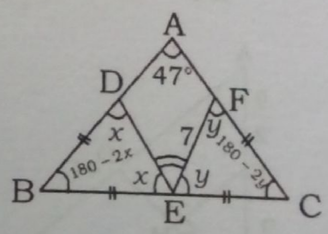
$2x + x = 71$ (external angle)

$2x + 2x = x + 71°$

$3x = 71 \Rightarrow x = \frac{71}{3}$

$\angle C = 2x = \frac{142}{3}$

93. (A)



$180 - 2x + 180 - 2y + 47 = 180°$