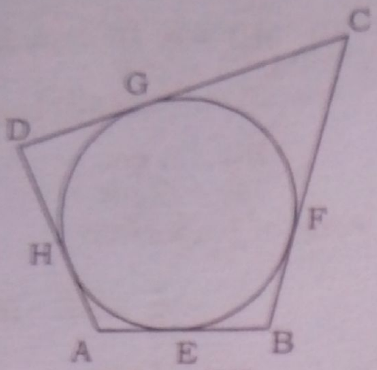
55. (A)



$\because$ DG = DH ...(i)

(tangent from a external point.)

GC = CF ...(ii)

EB = BF ...(iii)

AE = AH ...(iv)

From eq. (i) + (ii)

DC = DH + CF ...(v)

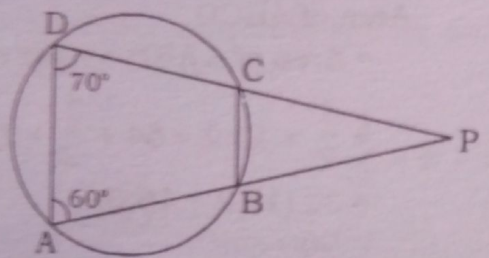
From eq. (iii) + (iv)

AB = BF + AH ...(vi)

From equ. (v) + (vi)

DC + AB = AD + BC

56. (A)



$\angle ABC + \angle BCD = 360° - (70° + 60°)$

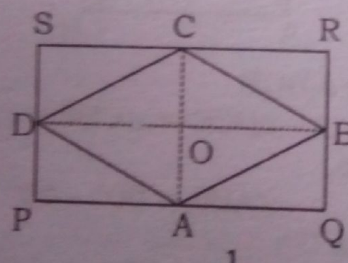
$\angle PBC + \angle BCP$

$= 360° - (\angle ABC + \angle BCD)$

$= 360° - 360° + (70° + 60°)$

$= 130°$

57. (D)



Area of Δ OAD = $\frac{1}{2}$ area of OAPD

Similar in all cases

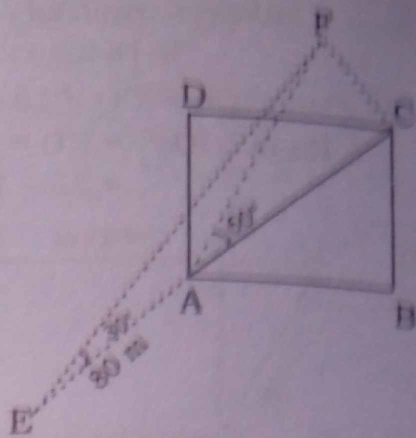
Area of ABCD

= Area of Δ OAD + Area of OAB

+ Area of Δ OBC + Area of Δ OCD

$= \frac{1}{2}$ area of (PQRS)

58. (C)



$$\frac{FC}{AC} = \tan 60°$$

$$FC = \sqrt{3}\,AC \quad ...(i)$$

$$\frac{FC}{EC} = \tan 30°$$

$$FC = \frac{1}{\sqrt{3}}(80 + AC) \quad ...(ii)$$

From equation (i) and (ii)

$$\sqrt{3}\,AC = \frac{1}{\sqrt{3}}(80 + AC)$$

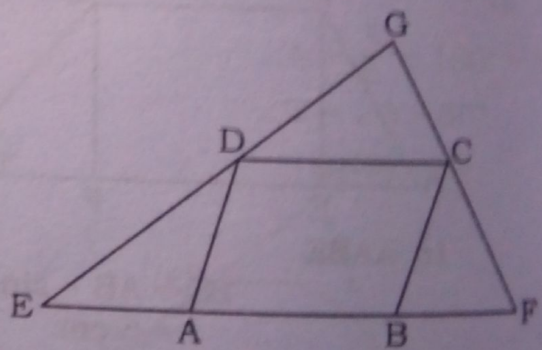
$$3AC = 80 + AC$$

$$AC = 40m$$

Side of the field (AB) $= \frac{AC}{\sqrt{2}}$

$= 20\sqrt{2}$ m

59. (C)



Let $\angle AED = x$

So,

$\angle BAD = 2x$

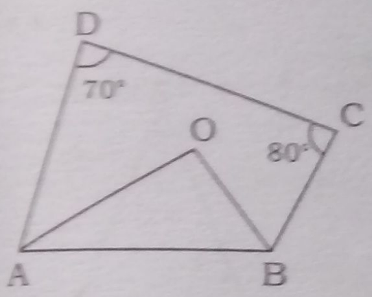
$\angle FBC = \angle BAD = 2x$

$$\angle BFC = \frac{1}{2}(180° - 2x)$$
$$= 90° - x$$
$$\angle CDG = \angle AED = x$$
$$\angle DCG = \angle BFC = 90° - x$$
$$\angle EGF = 180° - (x + 90° - x)$$
$$= 90°$$

60. (B) As we proof in above question

$$ED \perp CF$$

61. (D)



$$\angle BAD + \angle ABC = 360° - (70° + 80°)$$
$$= 210°$$

In ΔOAB

$$\angle OAB + \angle ABO + \angle AOB = 180°$$
$$\angle AOB = 180° - \frac{1}{2}(\angle OAB + \angle ABO)$$
$$= 180° - \frac{1}{2} \times 210°$$
$$= 75°$$

62. (A)
63. (A)
64. (B) ATQ,

at x-axis, $y = 0$

So,

$$3x + 4 \times 0 = 12$$

at y-axis, $x = 0$

So,

$$3 \times 0 + 4 \times y = 12$$
$$y = 3$$

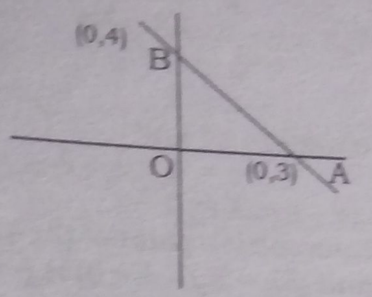
So, intercepts are 4 and 3.

65. (B) Intercepts made by $2x + 3y + 6 = 0$ will be 3 and 2.

So, area of triangle formed

$$= \frac{1}{2} \times 3 \times 2 = 3 \text{ sq. unit}$$

66. (B) Intercept made by line $4x + 3y = 12$ will be 3 and 4.



So,

length of AB $= \sqrt{3^2 + 4^2} = 5$

Radius of the circumcircle $= \frac{5}{2}$

$= 2.5$ unit

67. (D)
68. (A) ATQ,

$$\text{Area of } \Delta ABC = \frac{1}{2} \times 6 \times 8$$
$$= 24 \text{ cm}^2$$

So, area of triangle made by median

$$= \frac{3}{4} \times 24 = 18 \text{ cm}^2$$

69. (C) Slope of line $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-5}{9-7} = 1$

70. (C) Let equation of line is $y = mx + c$

$$\text{Slope } (m) = \frac{2-(-2)}{-5-(-1)} = \frac{4}{-4} = -1$$
$$y = -x + c$$
$$x + y - c = 0$$
$$f_{(-1,-2)} = 0$$
$$-1 - 2 - c = 0$$
$$-c = +3$$

equation of line is $x + y + 3 = 0$

71. (A) ATQ,

Point of intersection of $(x + y = 8)$ and $(3x + 2y + 1 = 0)$ is $(3, 5)$

$$\text{Slope of new line} = \frac{6-4}{5-4} = 1$$

So, put in equation

$$y = mx + c$$
$$y = x + c$$

Put $x = -3$ and $y = 5$

$$5 = 3 + c$$
$$c = 2$$

equation of line

$$y = 1 \times x + 2$$
$$x - y + 2 = 0$$

72.(C) Intersection point of $(2x - y + 5 = 0)$ and $(5x + 3y - 4 = 0)$ is $(-1, 3)$

Line is perpendicular to $x - 3y + c = 0$

put co-ordinates $(-1, 3)$

$$3(-1) + 3 + c = 0$$
$$c = 0$$

Equation of lines is $(3x + y = 0)$

73.(D) Property of parallel lines

$$\frac{x_1}{x_2} = \frac{y_1}{y_2} \neq \frac{c_1}{c_2}$$

$$\frac{3}{K} = \frac{4}{8} \Rightarrow K = 6$$

74. (B) Triangle is formed by joining mid points

So,

Area of original triangle : Area of new triangle

$= 4 : 1$

75. (A) Centroid of triangle

$$= \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$$

$$= \left(\frac{0 + 8 + 8}{3}, \frac{6 + 12 + 0}{3}\right)$$

$$= \left(\frac{16}{3}, 6\right)$$

76.(A) Vertices of triangle are $(3, -5)$, $(-7, 4)$ and (x, y)

Centroid $= (2, -12)$

ATQ,

$$\frac{3 - 7 + x}{3} = 2$$
$$x = 10$$

$$\frac{-5 + 4 + y}{3} = -12$$
$$y = -35$$

Co-ordinates (x, y) area $(10, -35)$

77. (B) Distance between two parallel lines

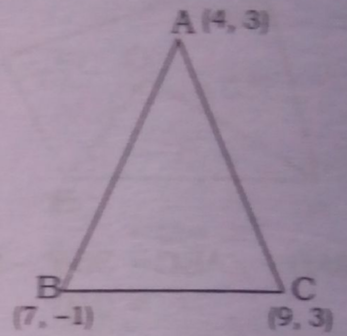
$$= \left|\frac{c_1 - c_2}{\sqrt{a^2 + b^2}}\right| = \left|\frac{-30 - (-4)}{\sqrt{5^2 + 12^2}}\right|$$

$$= \left|\frac{-26}{13}\right| = |-2| = 2$$

78. (B) ATQ,

$$(x - 0)^2 + [0 - (-5)]^2 = (13)^2$$
$$x^2 = 13^2 - 5^2 = 144$$
$$x = 12$$

79. (B)



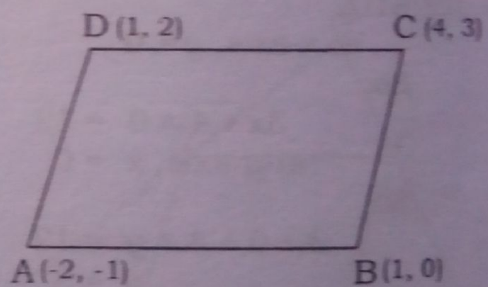
$$AB = \sqrt{(7 - 4)^2 + (-1 - 3)^2}$$
$$= 5 \text{ units}$$

$$BC = \sqrt{(9 - 7)^2 + [3 - (-1)]^2}$$
$$= 2\sqrt{5} \text{ units}$$

$$AC = \sqrt{(9 - 4)^2 + (3 - 3)^2}$$
$$= 5 \text{ units}$$

So, triangle is an isosceles triangle.

80. (C)



$$AB = \sqrt{(1 + 2)^2 + (0 + 1)^2}$$
$$= \sqrt{10} \text{ units}$$

$$BC = \sqrt{(4 - 1)^2 + (3 - 0)^2}$$
$$= 3\sqrt{2} \text{ units}$$

$$CD = \sqrt{(1-4)^2 + (2-3)^2}$$
$$= \sqrt{10} \text{ units}$$
$$DA = \sqrt{(-2-1)^2 + (-1-2)^2}$$
$$= 3\sqrt{2} \text{ units}$$

The quadrilateral may be a parallelogram or rectangle.

$$AC = \sqrt{(4+2)^2 + (3+1)^2}$$
$$= 2\sqrt{13} \text{ units}$$
$$DA = \sqrt{(-2-1)^2 + (-1-21)^2}$$
$$= 3\sqrt{2} \text{ units}$$

So, quadrilateral is a parallelogram.

81.(A)

82. (D) Centroid $= \left(\frac{6+2+4}{3}, \frac{6+3+7}{3}\right)$

$$= \left(4, \frac{16}{3}\right)$$

83. (A) A (1, – 2), B (3, 4) and C (4, 7)

So,

$$AB = \sqrt{(3-1)^2 + (4+2)^2}$$
$$= 2\sqrt{10} \text{ units}$$
$$BC = \sqrt{(4-3)^2 + (7-4)^2}$$
$$= \sqrt{10} \text{ units}$$
$$AC = \sqrt{(4-1)^2 + (7+2)^2}$$
$$= 3\sqrt{10} \text{ units}$$

AB + BC = AC

So, A, B and C are points on straight line.

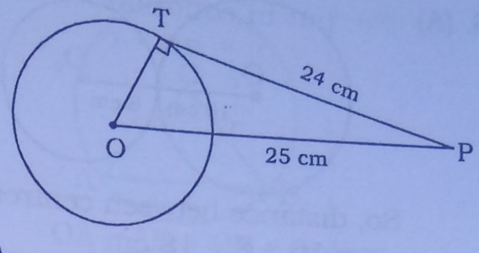
84. (B) Let x axis divide the line joining points (2, – 3) and (5, 6) in the ratio K : 1

So,

$$\frac{6 \times 1 + (-3) \times K}{K+1} = 0$$
$$6 - 3K = 0$$
$$K = 2$$

So, required ratio = 2 : 1

85. (B)



As we know,

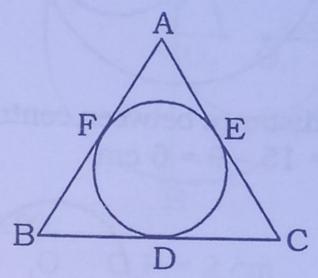
PT ⊥ OT (tangent to circle)

So,

$$(PT)^2 + (OT)^2 = (PO)^2$$
$$(OT)^2 = (25)^2 - (24)^2$$

Radius (OT) = 7 cm

86. (A)

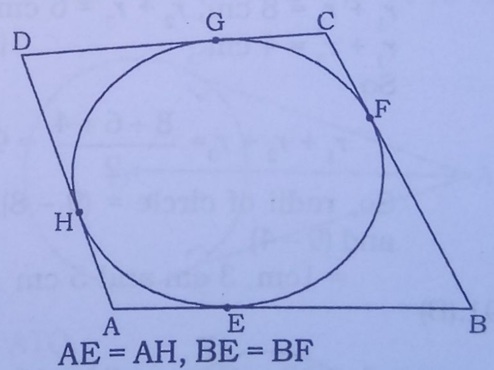


Perimeter of triangle = AB + BC + AC
= (AF + BD) + (BD + CE) + (AF + CE)
[∵ AF = AE, BF = BD and CD = CE]
= 2 (AF + BD + CE)

AF + BD + CE

$$= \frac{1}{2} \text{ (perimeter of } \Delta ABC)$$

87. (A)



AE = AH, BE = BF

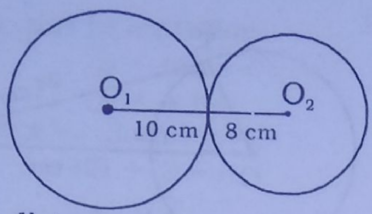
CF = CG and DG = DH

$$\underbrace{AE + BE}_{AB} + \underbrace{CG + DG}_{CD} = \overbrace{AH + BF + CF + DH}^{AD}$$

(with BF + CF bracketed as BC)

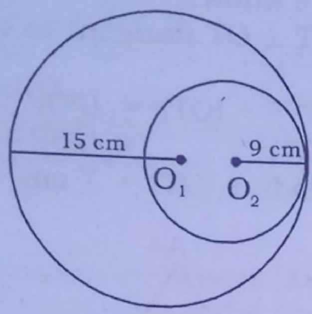
AB + CD = BC + AD

88. (A)



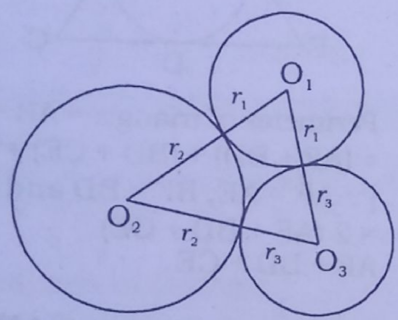
So, distance between centres (O_1O_2)
$= 10 + 8 = 18$ cm

89. (B)



So, distance between centres $(O_1\ O_2)$
$= 15 - 9 = 6$ cm

90. (B)

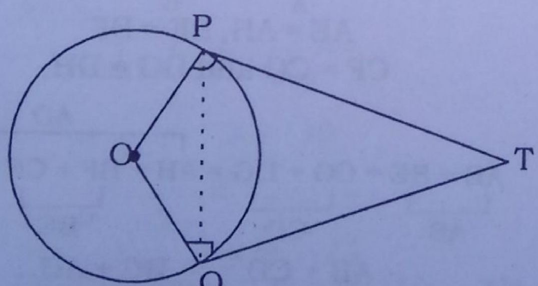


Given,
$r_1 + r_2 = 8$ cm, $r_2 + r_3 = 6$ cm and $r_1 + r_3 = 4$ cm
So,

$$r_1 + r_2 + r_3 = \frac{8+6+4}{2} = 9 \text{ cm}$$

So, radii of circle $= (9 - 8), (9 - 6)$ and $(9 - 4)$
$= 1$cm, 3 cm and 5 cm

91.(B)



In □ POQT,

$\angle P + \angle POQ + \angle Q + \angle PTQ = 360^\circ$
$\angle POQ = 360^\circ - 90^\circ - 90^\circ - \angle PTQ$
$\angle POQ = 180^\circ - PTQ$ ...(i)

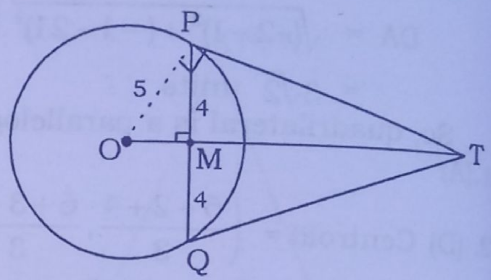
In ΔOPQ

$\angle POQ + \angle OPQ + \angle OQP = 180^\circ$
$(\angle OPQ = \angle OQP)$
$\angle POQ = 180^\circ - 2\angle OPQ$ ...(ii)

Comparing equation (i) and (ii)

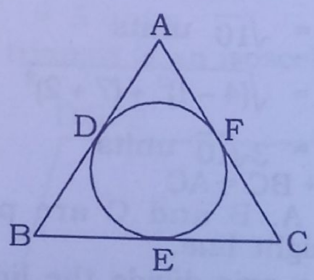
$180^\circ - \angle PTQ = 180^\circ - 2\angle OPQ$
$\angle PTQ = 2\angle OPQ$

92. (B)



$$OM = \sqrt{PO^2 - PM^2}$$
$$= 3 \text{ cm}$$
$$\Delta OTP \sqcup \Delta OPM$$
$$\frac{TP}{PO} = \frac{PM}{OM}$$
$$TP = \frac{4}{3} \times 5 = \frac{20}{3} \text{ cm}$$

93. (A)

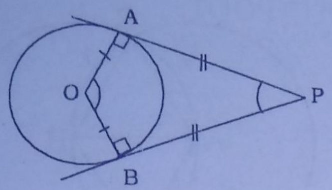


Perimeter of $\Delta ABC = 8 + 10 + 12 = 30$ cm
ATQ,

$AD + DB + BE + EC + CF + FA = 30$
$AD + BE + BE + EC + EC + AD = 30$
$2AD + 2BC = 30$

$$AD = \frac{30-20}{2} = 5 \text{ cm}$$

94. (C)



$\angle OAP + \angle OBP = 180°$ (angle made by the tangent with radius)

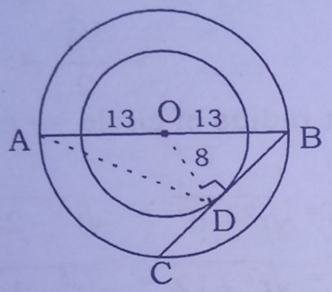
$\therefore \ \angle AOB + \angle APB = 180°$

($\because$ Sum of all angles of quadrilateral is 360°)

$\therefore$ AOBP is a cycle quadrilateral

$\because$ (Sum of opposite angles of cyclic quadrilateral is 180°)

95. (D)



As we know BC is a chord and OD is perpendicular to it, so BD = BC

ATQ,

$$BD = \sqrt{OB^2 - OD^2}$$

$$= \sqrt{(13)^2 - (8)^2}$$

$$= \sqrt{105} \text{ cm}$$

ΔABC is a right angle triangle

$(AC)^2 + (BC)^2 = (AB)^2$

$$AC = \sqrt{(26)^2 - (2 \times \sqrt{105})^2}$$

$$= 16$$

$$AD = \sqrt{(AC)^2 + (CD)^2}$$

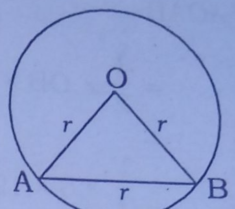
$$= \sqrt{(16)^2 + (\sqrt{105})^2}$$

$$= 29 \text{ cm}$$

96. (A)

97. (A)

98. (C)

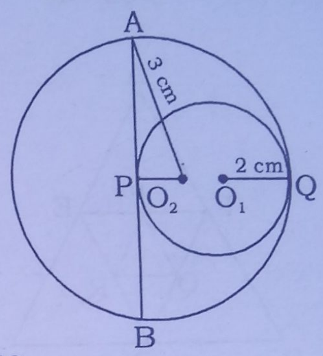


OA = AB = OB = radius

So, ΔOAB is equilateral triangle.

$\angle AOB = 60°$

99. (C)



ATQ,

$$O_1P = 2 \text{ cm}$$

$$O_2P = 2 \times O_1P - O_2Q$$

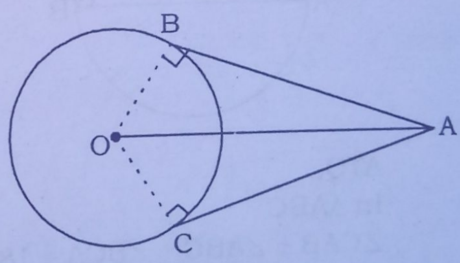
$$= 1 \text{ cm}$$

$$AO_2 = 3 \text{ cm}$$

$$AP = \sqrt{3^2 - 1^2} = 2\sqrt{2}$$

So, length of largest chord outside smaller circle (AB) $= 2 \times AP = 4\sqrt{2}$ cm.

100.(B)



ATQ,

OA = 13 cm, OB = OC = 5 cm

AB is tangent to circle, so $\angle OBA = 90°$

$$AB = \sqrt{(OA)^2 - (OB)^2}$$

$$= \sqrt{(13)^2 - (5)^2}$$

$$= 12 \text{ cm}$$

Area of ΔOAB

$$= \frac{1}{2} \times OB \times AB$$

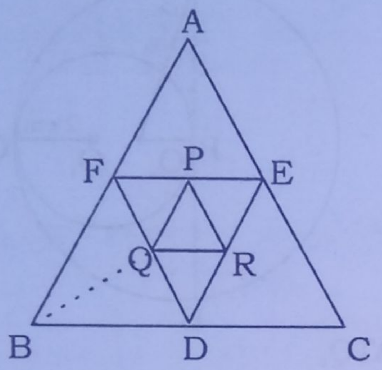
$$= \frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$$

So, Area of $\square$ ABOC

$= 2 \times$ Area of ΔOAB

$= 60 \text{ cm}^2$

101.(A)

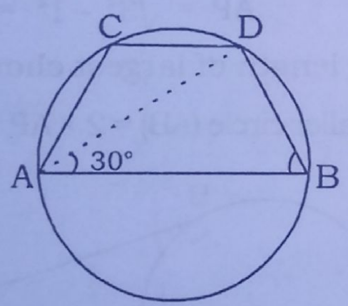


Area of ΔBDF = Area of ΔEFD

Area of ΔPQR = Area of ΔPRE

Area of ΔQRP : Area of ΔAFE = 1 : 4

102.(C)



ATQ,

In ΔABC

$\angle CAB + \angle ABC + \angle BCA = 180°$

$\angle ABC = 180° - 30° - 90°$

$= 60°$

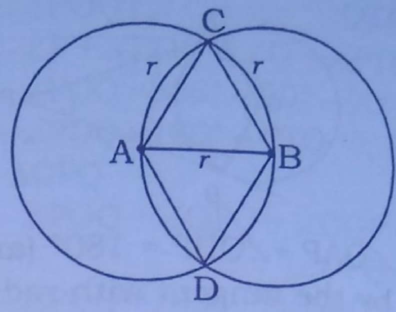
$\angle ADC + \angle ABC = 180°$

[property of a cyclic quadrilateral]

$\angle ADC = 180° - 60°$

$= 120°$

103.(D)



ATQ,

$AB = BC = CA = AD = BD = r$

So,

Area of CADB

$= 2 \times$ Area of ΔABC

$= 2 \times \frac{\sqrt{3}}{4} \times r^2$

$= \frac{\sqrt{3}}{2} r^2$

104.(B) Let radius of circle = r cm

So,

$OE = \sqrt{r^2 - 5^2} = \sqrt{r^2 - 25}$

$OF = \sqrt{r^2 - 12} = \sqrt{r^2 - 144}$

$OE + OF = 17$

$\sqrt{r^2 - 25} + \sqrt{r^2 - 144} = 17$

$\sqrt{r^2 - 25} = 17 - \sqrt{r^2 - 144}$

squaring both sides

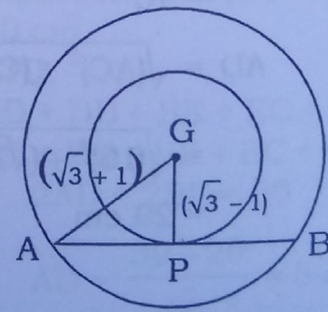
$r^2 - 25 = 289 + r^2 - 2 \times 17 \times \sqrt{r^2 - 144}$

$2 \times 17 \times \sqrt{r^2 - 144} = 170$

$\sqrt{r^2 - 144} = 5$

$r = 13$ cm

105.(B)



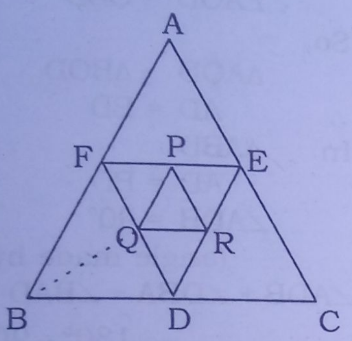
ATQ.

$$AP = \sqrt{(AG)^2 - (GP)^2}$$
$$= \sqrt{(\sqrt{3}+1)^2 - (\sqrt{3}-1)^2}$$
$$= \sqrt{4 \times 1 \times \sqrt{3}}$$
$$= 2\sqrt[4]{3}$$

So, length of chord (AB)

$$= 2 \times AB$$
$$= 4\sqrt[4]{3}$$

106.(B)



Area of ΔBDF = Area of ΔEFD

Area of ΔPQR = Area of ΔPRE

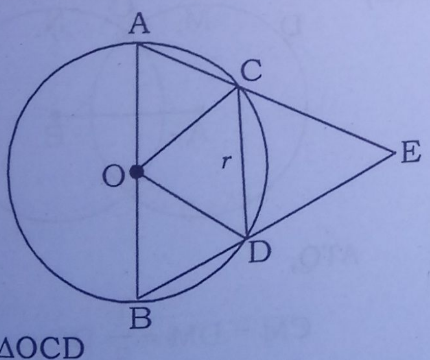
Required ratio =

$$\frac{\text{Area of } \Delta PRE}{\text{Area of } \Delta BDQ}$$

$$= \frac{\text{Area of } \Delta PRE}{\frac{1}{2} \times 4 \times \text{Area of } \Delta PRE}$$

Area of ΔPRE : Area of ΔBDQ = 1 : 2

107.(B)



In ΔOCD

$$OC = OD = CD$$

So,

$$\angle OCD = \angle CDO = \angle DOC = 60^\circ$$

Let $\angle ABE = y = \angle BDO$

So, $\angle BOD = 180^\circ - 2y$ ...(i)

Let $\angle OAC = x = \angle OCA$

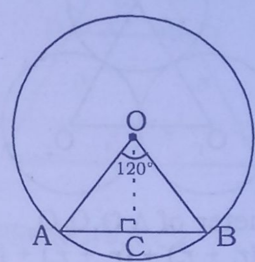
So, $\angle AOC = 180^\circ - 2x$

$$\angle AOC + COD + \angle BOD = 180^\circ$$
$$180^\circ - 2x + 60^\circ + 180^\circ - 2y = 180^\circ$$
$$x + y = 120^\circ$$

In ΔABE

$$\angle ABF + \angle BAE + \angle AEB = 180^\circ$$
$$\angle AEB = 180^\circ - (x + y)$$
$$= 60^\circ$$

108.(C)



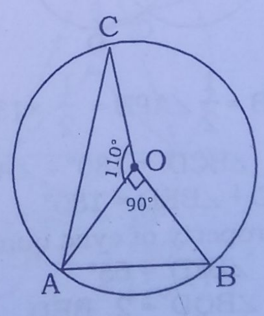
Let OA = Ob = r cm

In ΔOAB

$$\angle OAB + \angle ABO + \angle BOA = 180^\circ$$
$$\angle OAB = \frac{180^\circ - 120^\circ}{2} = 30^\circ$$
$$\frac{AC}{OA} = \cos 30^\circ$$
$$AC = \frac{\sqrt{3}}{r}$$
$$AB = 2 \times AC = \sqrt{3}r$$

So, length of the chord is $\sqrt{3}$ times of the radius.

109.(A)

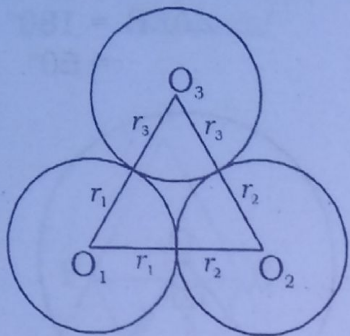


ATQ,

$$\angle BOC = 360^\circ - \angle AOB - \angle AOC$$
$$= 360^\circ - 90^\circ - 110^\circ$$
$$= 160^\circ$$

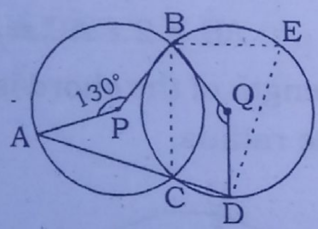
$$\angle BAC = \frac{1}{2}\angle BOC$$
$$= \frac{1}{2} \times 160° = 80°$$

110.(C)
111.(A)
112.(B)
113.(D)
114.(A)



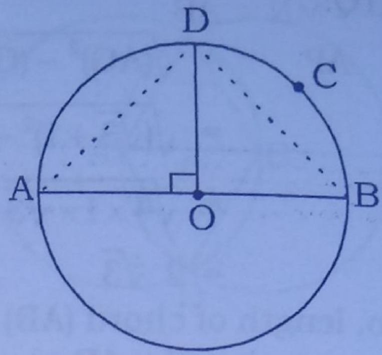
Perimeter of $\Delta\, O_1O_2O_3$
$= (r_1 + r_2) + (r_2 + r_3) + (r_1 + r_3)$
$= 2\,(r_1 + r_2 + r_3)$
$S = (r_1 + r_2 + r_3)$
Area of $\Delta\, O_1O_2O_3$
$= \sqrt{s(s-a)(s-b)(s-c)}$
$= \sqrt{(r_1 + r_2 + r_3) \times r_1 \times r_2 \times r_3}$
$= \sqrt{(r_1 + r_2 + r_3)\ r_1\, r_2\, r_3}$

115.(C)



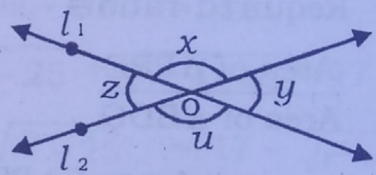
$$\angle ACB = \frac{1}{2}\angle APB = \frac{1}{2} \times 130° = 65°$$
$\angle BCD = 180° - \angle ACB = 115°$
$\angle BCD + \angle BED = 180°$
(Property of cylic quadrilateral)
$\angle BED = 65°$
$\angle BQD = 2\ \ BED$
$= 2 \times 65°$
$= 130°$

116.(B)



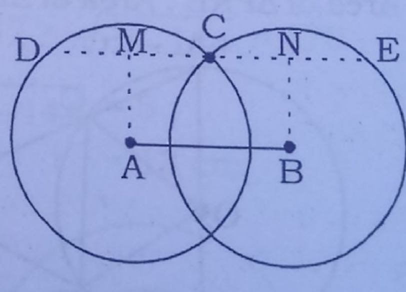
$OA = OB$
$OD = OD$
$\angle AOD = OBD$
So,
$\Delta AOD \cong \Delta BOD$
$\therefore$ $AD = BD$
In ΔABD
$AD = BD$
$\angle ADB = 90°$
(angle made by diameter)
$\angle ADB + \angle DBA + \angle BAD = 180°$
$$\angle BAD = \frac{180° - 90°}{2}$$
$= 45°$

117.(B)



$\angle x + \angle y = 180°$
$\angle y = 180° - 45°$
$= 135°$

118.(B)



ATQ,

$$CM = DM = \frac{1}{2}\ DC$$
$$CN = NE = \frac{1}{2}\ CE$$

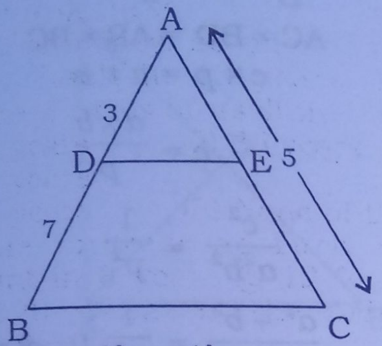
$MN = AB$

So,
$$
\begin{aligned}
DE &= DC = CE \\
&= 2\ CM + 2\ CMN \\
&= 2(MC + CN) \\
&= 2(MN) \\
&= 2AB
\end{aligned}
$$

119.(C)

120.(B)

121.(C)



$\angle A = \angle A$

$\angle ADE = \angle ABC$

(correspoinding angle)

$\angle AED = \angle ACB$

(corresponding angle)

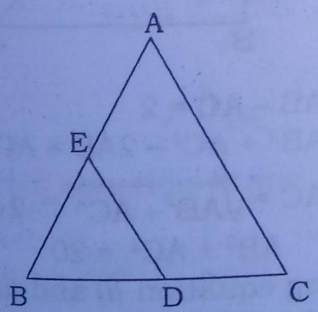
$\Delta ADE \sqcup \Delta ABC$

$$\frac{AE}{AC} = \frac{AD}{AB}$$

$$AE = \frac{3}{10} \times 5$$

$$= 1.5 \text{ cm}$$

122.(D)



$$\frac{\text{Area of } \Delta BDE}{\text{Area of } \Delta ABC} = \left(\frac{BD}{BC}\right)^2$$

$$\text{Area of } \Delta BDE = \frac{30}{4}$$

$$= 7.5 \text{ cm}^2$$

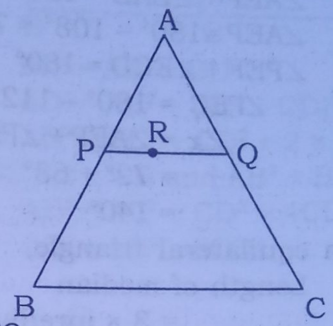
123.(B) Altitude of equilateral triangle

$$= \frac{\sqrt{3}}{2} \times \text{side}$$

$$= \frac{\sqrt{3}}{2} \times 2a$$

$$= a\sqrt{3}$$

124.(C)



ATQ,

$PR : RQ = 1 : 2$

$$PQ = PR \times \frac{3}{1}$$

$$= 2 \times 3$$

$$= 6 \text{ cm}$$

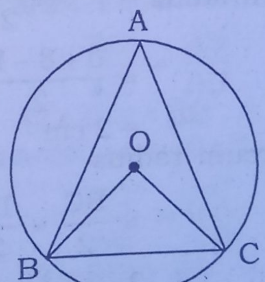
$$\text{As, } \frac{AP}{AB} = \frac{AQ}{AC} = \frac{1}{2}$$

$$\text{So, } \frac{PQ}{BC} = \frac{1}{2}$$

$$BC = 2 \times 6$$

$$= 12 \text{ cm}$$

125.(A)



$\angle OBC = 35°$

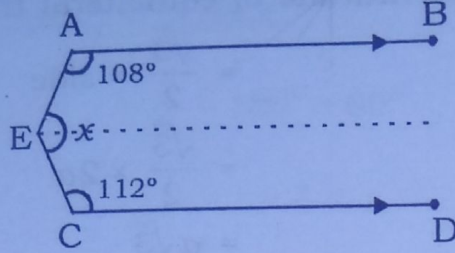
$\angle BOC = 180° - 2 \times 35°$

$= 110°$

$$\angle BAC = \frac{1}{2} \times \angle BOC$$

$$= \frac{1}{2} \times 110° = 55°$$

126.(B)



$\angle AEP + \angle EAB = 180°$

$\angle AEP = 180° - 108° = 72°$

$\angle PEF + \angle ECD = 180°$

$\angle PEC = 180° - 112° = 68°$

$\angle x = \angle AEP + \angle PEC$

$= 72° + 68°$

$= 140°$

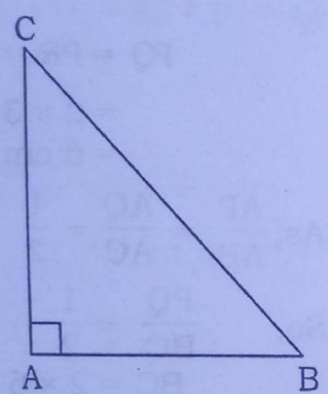
127.(D) In equilateral triangle,

Length of median

$= 3 \times$ inradius

$= 3 \times 3 = 9$ cm

128.(B)



$$\text{Inradius} = \frac{AB + AC - BC}{2}$$

$$= \frac{6 + 8 - 10}{2}$$

$= 2$ cm

Circum radius

$$= \frac{BC}{2} = \frac{10}{2} = 5 \text{ cm}$$

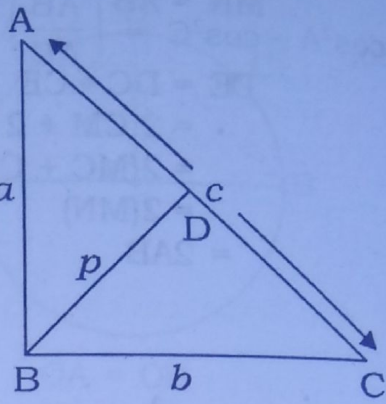
129.(C) Length of AG $= \frac{2}{3} \times$ length of median

$$= \frac{2}{3} \times 12$$

$= 8$ cm

130.(A) Distance between orthocentre and circumcentre is equal to circumradius = 13 cm

131.(B)



$AC \times BD = AB \times BC$

$c \times p = a \times b$

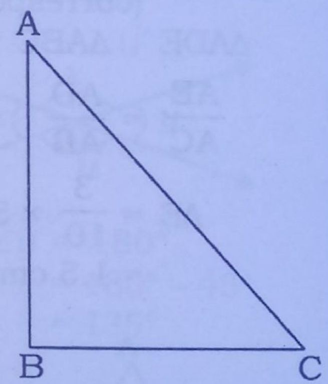
$$c = \frac{a \times b}{p}$$

$$\frac{c^2}{a^2b^2} = \frac{1}{p^2}$$

$$\frac{a^2 + b^2}{a^2b^2} = \frac{1}{p^2} \quad [\because c^2 = a^2 + b^2]$$

$$\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2}$$

132.(A)



$AB - AC = 2$

$AB^2 + AC^2 - 2AB \times AC = 4$ ...(i)

$AC = \sqrt{AB^2 + AC^2} = 2\sqrt{5}$

$AB^2 + AC^2 = 20$ ...(ii)

Using equation (i) and (ii)

$2 \times AB \times AC = 16$

$AB^2 + AC^2 = 16$

$AB^2 + AC^2 + 2 \times AB \times AC$

$= 20 + 16$

$AB + AC = 6$

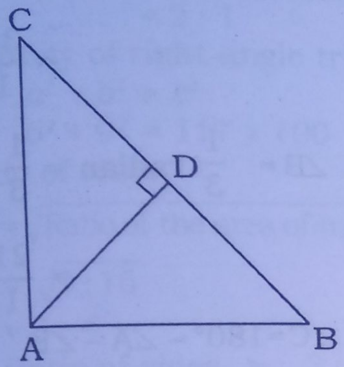
$AB = 4$ and $AC = 2$

$$\cos^2 A - \cos^2 C = \left(\frac{AB}{AC}\right)^2 - \left(\frac{BC}{AC}\right)^2$$

$$= \left(\frac{4}{2\sqrt{5}}\right)^2 - \left(\frac{2}{2\sqrt{5}}\right)^2$$

$$= \frac{4}{5} - \frac{1}{5} = \frac{3}{5}$$

133.(B)



$\Delta ABC \sqcup \Delta DBA$

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

$$AD = \frac{2 \times AB}{AB} \times BD$$

$$= 2BD \qquad \ldots(i)$$

$\Delta ABC \sqcup \Delta DAC$

$$\frac{AB}{AC} = \frac{AD}{DC}$$

$$AD = \frac{2 \times AB}{AB} \times DC$$

$$= \frac{1}{2} DC \qquad \ldots(ii)$$

From equation *(i)* and *(ii)*

$$2BD = \frac{1}{2} DC$$

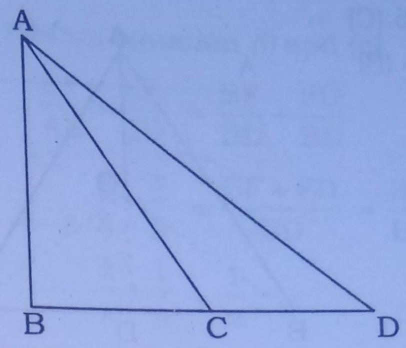
$$4BD = DC$$

Adding BD on both side

$$5BD = BD + DC = BC$$

$$BD = \frac{BC}{5}$$

134.(D)



$AD^2 = AB^2 + BD^2$

$AD^2 = AB^2 + (BC + CD)^2$

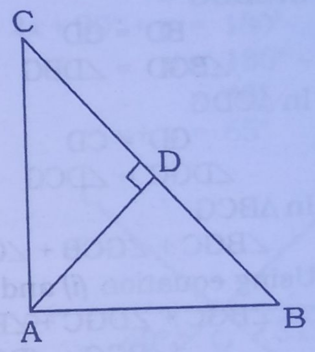
$= AB^2 + BC^2 + CD^2 + 2 \times BC \times CD$

$[\because BC = 2 \times CD$ and $AB^2 + BC^2 = AC^2]$

$AD^2 = AC^2 + CD^2 + 4CD^2$

$AC^2 = AD^2 - 5CD^2$

135.(C)



ATQ,

$AO \perp BC$ and also $BC = CD$

$\Delta ABC \sqcup \Delta DBA \sqcup \Delta DAC$

In ΔABC and ΔDBA

$$\frac{BC}{AB} = \frac{AB}{BD}$$

$$(2 \times BD) \times BD = AB^2 \qquad \ldots(i)$$

In ΔABC and ΔDAC

$$\frac{BC}{AC} = \frac{AC}{CD}$$

$$(2 \times BD) \times BD = AC^2 \qquad \ldots(ii)$$

From equation (i) and (ii)

$AB^2 = AC^2 \Rightarrow AB = AC$

So,

$$BC = \sqrt{AB^2 + AC^2} = \sqrt{2}\,AB$$

$$AB : BC : CA = 1 : 1 : \sqrt{3}$$

$$= \sqrt{3} : \sqrt{3} : 3$$