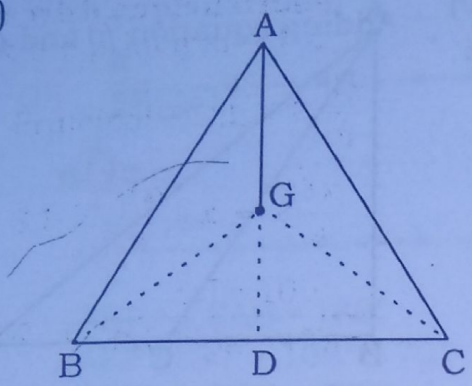
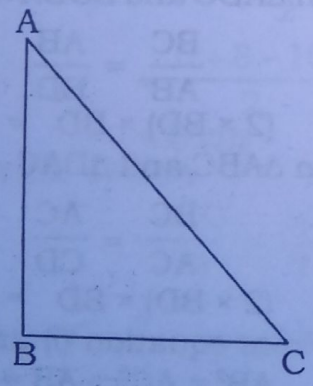
136.(C)



G is the centroid of triangle.
So, AG : GD = 2 : 1
As, AD is median,
So, BD = CD
AG = BC (∴ given)
So, GD = BD = CD
In ΔBDG
BD = GD
∠BGD = ∠DBG ...*(i)*
In ΔCDG
GD = CD
∠DGC = ∠DCG ...*(ii)*
In ΔBCG
∠BGC + ∠GCB + ∠CBG = 180°
Using equation *(i)* and *(ii)*
∠BGC + ∠DGC + ∠BGD = 180°
[∠BGC = ∠BGD + ∠DGC]
∠BGC + ∠BGC = 180°
∠BGC = 90°

137.(D)

138.(A)



ATQ,

$$AB = \frac{1}{2}BC$$

$$\frac{AB}{BC} = \sin(\angle ACB)$$

$$\sin(\angle ACB) = \frac{1}{2}\frac{BC}{BC} = \frac{1}{2}$$

$$\sin(\angle ACB) = \sin 30°$$

$$\angle ACB = 30°$$

139.(C) In triangle

$$\angle A + \angle B + \angle C = 180°$$

$$\angle A = \frac{1}{2} \text{ radian} = \frac{1}{2} \times 180° \times \frac{7}{22}$$

$$= \frac{315^\circ}{11}$$

$$\angle B = \frac{1}{3} \text{ radian} = \frac{1}{3} \times 180° \times \frac{7}{22}$$

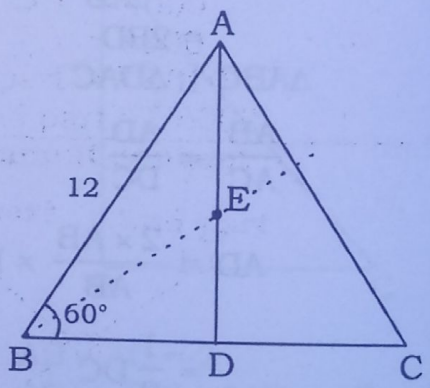
$$= \frac{210^\circ}{11}$$

$$\angle C = 180° - \angle A - \angle B$$

$$= 180° - \frac{315^\circ}{11} - \frac{210^\circ}{11} = \frac{1455^\circ}{11}$$

$$= 132\frac{3}{11}^\circ$$

140.(B)



ATQ,
In ΔABD

$$\frac{AD}{AB} = \sin 60°$$

$$AD = \frac{\sqrt{3}}{2} \times 12 = 6\sqrt{3}$$

$$\frac{BD}{AB} = \cos 60°$$

$$BD = \frac{1}{2} \times 12 = 6 \text{ cm}$$

In ΔBDE

$$\frac{ED}{BD} = \tan 30°$$

$$ED = \frac{1}{\sqrt{3}} \times 6 = 2\sqrt{3}$$

$$AE : ED = 4\sqrt{3} : 2\sqrt{3}$$
$$= 2 : 1$$

141.(A) Property of right angle triangle

$a^2 + b^2 > c^2$

$6^2 + 9^2 = 117 > 100$

142.(B) Ratio of sides

$= \sqrt{\text{Ratio of the area of triangles}}$

$= \sqrt{9:16}$

$= 3 : 4$

143.(A) Ratio of sides = 3 : 4 : 5

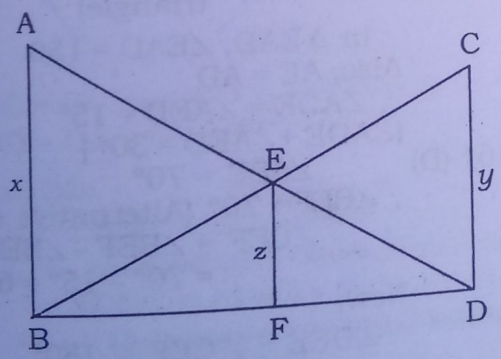
let sides of triangle = $3x$, $4x$ and $5x$

$$\text{Circumradius} = \frac{5x}{2} = 2.5x$$

$$\text{Inradius} = \frac{3x + 4x - 5x}{2} = x$$

circumradius : Inradius = $2.5x : x$
$= 5 : 2$

144.(A)



$\Delta ABD \sim \Delta EFD$

$$\frac{EF}{AB} = \frac{FD}{BD} \quad \ldots(i)$$

$\Delta BDD \sim \Delta BEF$

$$\frac{EF}{CD} = \frac{BF}{BD} \quad \ldots(ii)$$

Adding equation *(i)* and *(ii)*

$$\frac{EF}{AB} + \frac{EF}{CD} = \frac{BF}{BD} + \frac{FD}{BD}$$

$$\frac{z}{x} + \frac{z}{y} = \frac{BF + FD}{BD} = \frac{BD}{BD}$$

$$\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$$

145.(B)

146.(C) $3x + 5x + 12° = 180°$

$$x = \frac{180° - 12°}{8}$$
$$= 21°$$

147.(B) $3x + 105° = 180°$

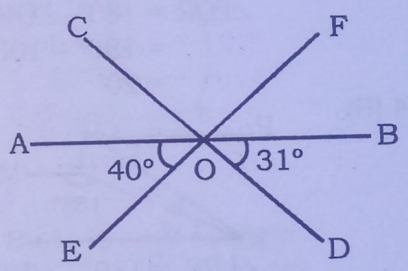
$x = 25°$

$2x + 90° + y = 180°$

$y = 180° - 90° - 50°$
$= 40°$

$x + y = 65°$

148.(B)



$\angle DOE = 180° - 40° - 31°$
$= 109°$

$\angle BOC = \angle AOD = \angle AOE + \angle DOE$
$= 109° + 40°$
$= 149°$

149.(D) $2x + 17° + x + 4° = 90°$

$3x = 69°$

$x = 23°$

150.(A) $5y + 62° + 22° + y = 180°$

$6y = 96°$

$y = 16°$

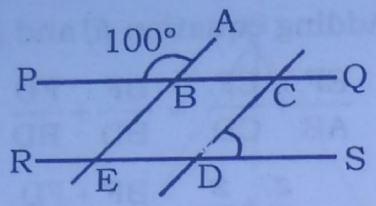
151.(A) ATQ,

$13x + 5x = 180°$

$x = 10°$

So, greater angle = 130°

152.(B)



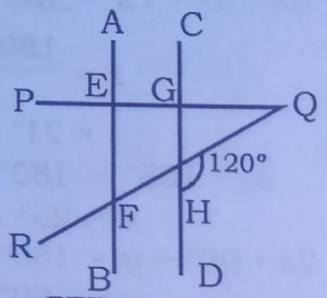
$\angle ABP = \angle CBE = 100°$ (opposite angle)

$\angle BCD = 180° - \angle CBE$

$= 80°$

$\angle BCD = \angle CDS = 80°$

153.(B)



$\angle PEB = \angle PGH = 180°$

$\angle QGH = 180° - 80° = 100°$

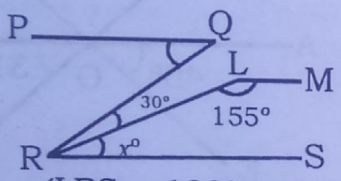
$\angle GHQ = 180° - 120° = 60°$

$\angle PQR = 180° - \angle QGH - \angle GHQ$

$= 180° - 100° - 60°$

$= 20°$

154.(B)



$\angle LRS = 180° - \angle RLM$

$= 180° - 155° = 25°$

$\angle PQR = \angle QRS = 30° + 25°$

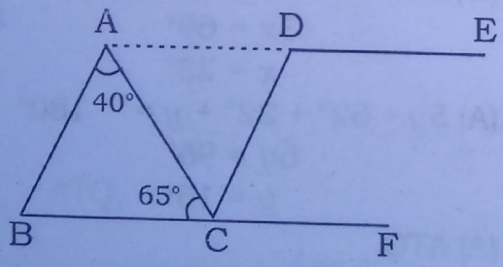
$= 55°$

155.(B) ATQ,

$x + 5x = 180°$

$x = 30°$

156.(C)



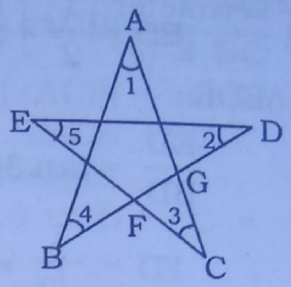
$\angle DAC = \angle ACB = 65°$

$\angle CDE = \angle BAD = \angle BAC + \angle DAC$

$= 40° + 65° = 105°$

157.(B)

158.(A)



In ΔFGC

$\angle FGC = \angle 1 + \angle 4$

(Exterior angle property)

$\angle GFC = \angle 2 + \angle 5$

(Exterior angle property)

In ΔFGC

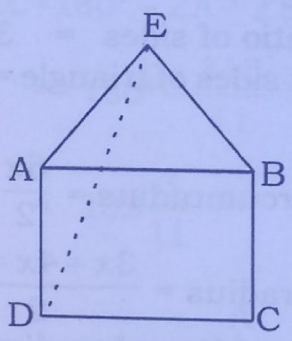
$\angle 3 + \angle 1 + \angle 4 + \angle 2 + \angle 5 = 180°$

159.(A) ATQ,

$2x + 3x = 180° \cong x = 36°$

Smaller angle $= 2x = 2 \times 36° = 72°$

160.(B)



$\angle BAD = 90°$ (Angle of a square)

$\angle EAD = 60°$ (Angle of a equilateral triangle)

$\therefore$ In ΔEAD, $\angle EAD = 150$

Also, $AE = AD$

$\therefore \angle ADE = \angle AED = 15°$

$(\angle ADE + \angle AED = 30°)$

161.(D) $\angle ABE = 70°$

$\therefore \angle BEF = 70°$ (Alternative angle)

$\angle CEF = \angle BEF - \angle BEC$

$= 70° - 15° = 65°$

Now,

$\angle DCE + \angle CEF = 180°$

$\angle DCE + 55° = 180°$

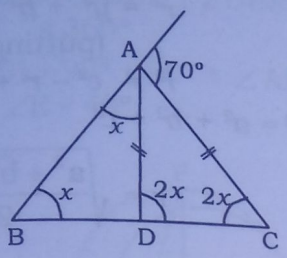
$\therefore \angle DCE = 125°$

162.(C) $\frac{10}{PQ} = \frac{24}{60} \therefore PQ = 25$ cm.

$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \left(\frac{\text{side}}{\text{side}}\right)^2$$

$$= \left(\frac{\text{Perimeter}}{\text{Perimeter}}\right)^2 = \left(\frac{\text{Median}}{\text{Median}}\right)^2$$

163.(A)



Let $\angle BAD = \angle ABD = x$

$\therefore$ $\angle ADC = 2x$ (Property of exterior angle)

$\therefore$ $\angle ADC = \angle ADC = 2x$ (Angle opp. to equal side.)

In ΔABC,

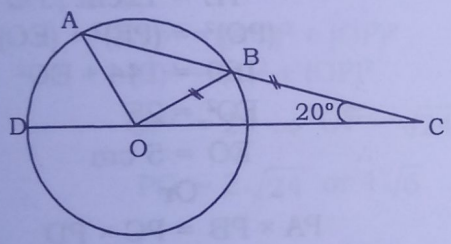
$\angle ACD + \angle ABD = 70°$

(Exterior angle)

$$3x, 70° \Rightarrow x = \frac{70}{3}$$

$$\angle ACD = 2x = \frac{70}{3} \times 2 = \frac{140}{3}$$

164.(C)



BC = OC and OD is the radius

OD = OA = OB = BC

In ΔBOC

$\angle BCD = 20° = \angle BOC$

(Angles opp. to equal sides)

$\therefore$ $\angle OBA = \angle OAB = 40°$

(Angle opp. to equal sides)

In ΔAOB,

$\angle AOB = 180° - 40° - 40°$

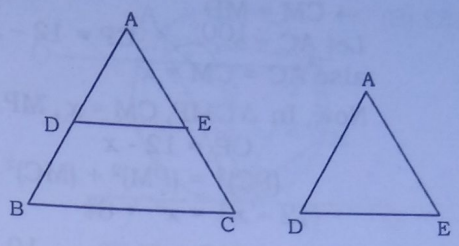
$= 100°$

$\therefore$ $\angle AOD = 180° - \angle AOB - \angle BOC$

$= 180° - 100° - 20°$

$\therefore$ $\angle AOD = 60°$

165.(C)



$$\frac{\text{Area of } \Delta ABD}{\text{Area of } \Delta ADE} = \frac{2}{1}$$

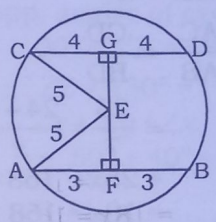
$$\frac{\text{side of ABD}}{\text{side of ADE}} = \frac{\sqrt{2}}{1}$$

$\therefore$ AD = 1 AB = $\sqrt{2}$

$\therefore$ DB = $\sqrt{2} - 1$

$\therefore$ AD : DB $\Rightarrow 1 : \sqrt{2} - 1$

166.(B)



In ΔAEF In ΔCGF

$(AE)^2 = (AF)^2 + (FE)^2$

$(CE)^2 = (CG)^2 + (GE)^2$

$(5)^2 = (3)^2 + (FE)^2$

$(5)^2 = (4)^2 + (GE)^2$

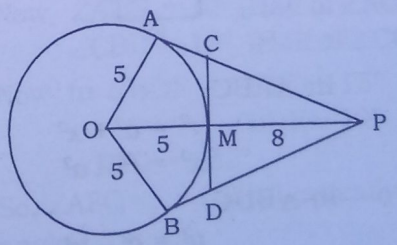
$25 - 9 = (FE)^2$ $\quad 25 - 16 = (GE)^2$

$16 = (FE)^2$ $\quad 9 = (GE)^2$

$\therefore$ FE = 4cm $\quad \therefore$ GE = 3cm

$\therefore$ Distance between two chords = 7 cm

167. (A)



$\rightarrow$ CM = MD

Let AC = x, $\therefore$ CP = $12 - x$

also AC = CM = x

Now, In ΔCMP, CM = x, MP = 8 cm

$$CP = 12 - x$$

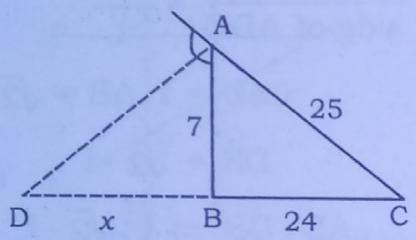
$$(PC)^2 = (PM)^2 + (MC)^2$$

$$(12 - x) = x^2 + 8^2$$

$$24x = 80 \Rightarrow x = \frac{10}{3}$$

$$CD = 2x = \frac{20}{3} \text{ cm.}$$

168. (B)



Let BD = x

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

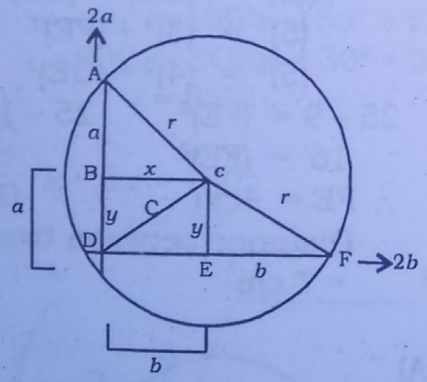
$$= \frac{25}{7} = \frac{24 + x}{x}$$

$$= 25x = 168 + 7x$$

$$= 18x = 168$$

$$\Rightarrow \quad x = \frac{28}{3} \text{ cm}$$

169. (A)



In ΔABC,

$$r^2 = a^2 + x^2$$

$$x^2 = r^2 - a^2$$

In ΔBDC,

$$y^2 = c^2 - x^2$$

Putting value of x

$$y^2 = c^2 - r^2 + a^2$$

In ΔCEF,

$$r^2 = y^2 + b^2$$

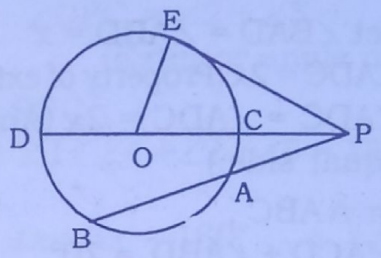
(putting value of y^2)

$$r^2 = c^2 - r^2 + a^2 + b^2$$

$$2r^2 = a^2 + b^2 + c^2$$

$$r = \sqrt{\frac{a^2 + b^2 + c^2}{2}}$$

170. (A)



2

$$PE^2 = PA \times PB$$

$$PE^2 = 9 \times 16 \Rightarrow PE^2 = 144$$

$$\therefore \quad PE = 12\text{cm}$$

Now, In Δ POE,

$$PE = 12\text{cm}, PO = 13\text{cm}$$

$$(PO)^2 = (PE)^2 + (EO)^2$$

$$169 = 144 + EO^2$$

$$\Rightarrow \quad EO^2 = 25$$

$$\therefore \quad EO = 5 \text{ cm}$$

Or

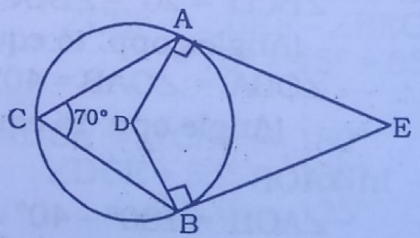
$$PA \times PB = PC \times PD$$

$$9 \times 16 = (13 - r)(13 + r)$$

$$144 = 132 - r^2$$

$$r^2 = 25 \Rightarrow r = 5 \text{ cm}$$

171. (B)



$\angle$DAE = $\angle$DBE = 90°

(Angle formed by joining centre with the tangent)

$\angle$ADB = 2$\angle$ACB = 140°

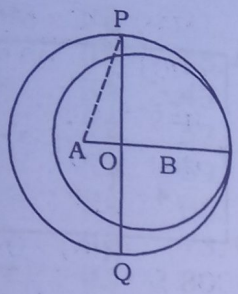
(Angle formed at the centre is double of the angle formed at any other point on arc of circle)

$\angle ADB + \angle DAE + \angle DBE + \angle AEB$
$= 360°$

$140° + 90° + 90° + \angle AEB = 360°$

$\therefore \angle E = 40°$

172. (A)



PQ is the perpendicular bisector of AB intersecting AB at O.

$AB = 2cm$,

$\therefore \quad AD = 1cm$

$AP = 5cm$

(radius of bigger circle)

In ΔAPO,

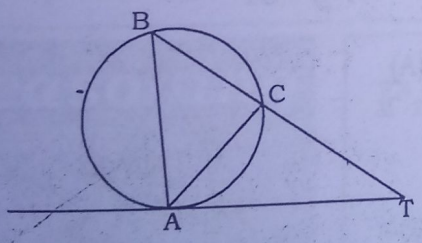
$(AP)^2 = (AO)^2 + (OP)^2$

$(5)^2 = (1)^2 + (OP)^2$

$OP^2 = 24 \Rightarrow OP = \sqrt{24}$

$\therefore \quad PQ = 2\sqrt{24}$ or $4\sqrt{6}$

173. (A)



$\angle CAT = 44°$

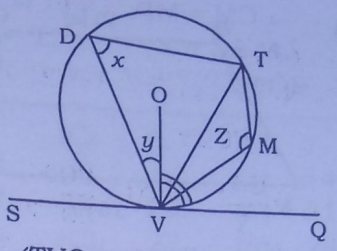
$\therefore \quad \angle CBA = 44°$

(Angle formed by chord AC)

$\angle ACB = \angle CAT + \angle ATC$
$= 84$ (Exterior angle)

$\therefore \quad \angle BAC = 181° - 84° - 44°$
$= 52°$

174. (A)



$\angle TVQ = 50°$ (given)

$\therefore \quad \angle TRV = 50°$ (angle formed by the same chord)

$\angle RTV = 50°$ (given)

So, In ΔTRV,

$\angle TVR = 180° - 50° - 50 = 80°$

$\therefore \quad \angle OVR = \frac{80°}{2} = 40°$

(OV is angle bisector of $\angle TVR$)

$\angle x + \angle Z = 180°$

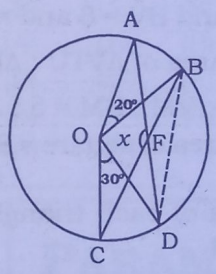
(opp. angles of cycyle quadrilateral)

$50° + \angle Z = 180°$

$\therefore \quad \angle Z = 130° = \therefore \angle TMV$

$\therefore \quad \angle x + \angle y + \angle x$
$= 50° + 40° + 130° = 220°$

175. (C)



$\angle AOB = 20°$ (given)

$\angle COD = 30°$ (given)

Join BD

Now, $\angle ADB = 10°$ (Half of $\angle AOB$)

$\angle CBD = 15°$ (Half of $\angle COD$)

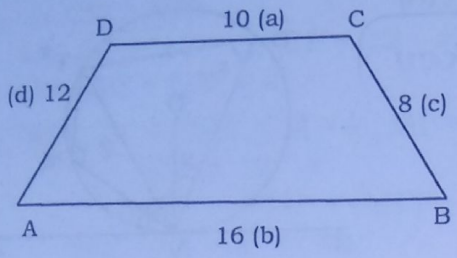
Now, In $\Delta BDF = \angle FBD = 15°$

$\angle BDF = 10°$

$\therefore \quad \angle BFD = 155°$

So, $\angle AFC = x = 155°$ (Vertically opp. angle.)

176. (D)



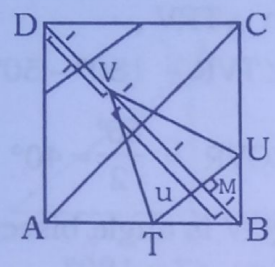
Square of diagonals

$(AC)^2 + (BD)^2 = c^2 + d^2 + 2 \times a \times b$

$= 144 + 64 + 2 \times 10 \times 16$

$= 528 \text{ cm}^2$

177. (A)



As V lies on BD.

$BM = \frac{1}{4} BD, BV = \frac{2}{3} BD$

Let BD = 12, BM = 3

and BV = Ɛ and = 5

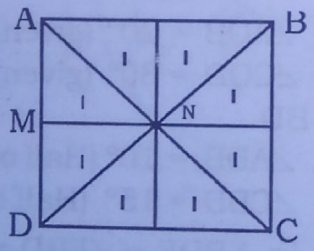
∴ Area of ΔVTU : ΔBTU

= VM : BM = 5 : 3

178. (B) Let Area of square = 8 square units

So,

area of each triangle = 1 square unit



Area of □ AMNB : □ ABCD

= (1 + 1 + 1) : 8

= 3 : 8

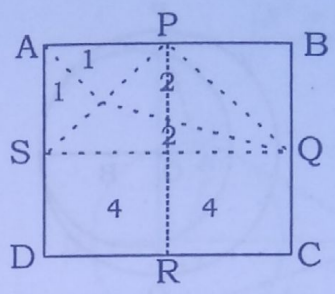
179. (D) Let Area of square = 16 sq. units

So, Area of ΔPQS

$= \frac{8}{2} = 4$ sq. units

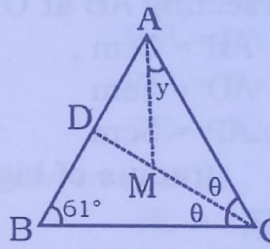
So, area of ΔPQT = 2

Area of ΔATS = 1



Required ratio 1 : 2

180. (A)



AD = AM, Y = ?

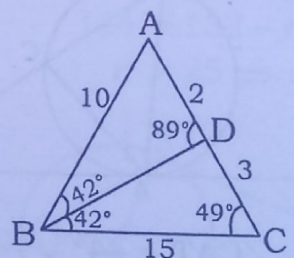
61° + θ = ∠CDA (exterior angle)

∠CDA = ∠AMD (exterior angle, θ + y)

61° + θ = θ + y

∴ y = 61°

181. (A)



$\frac{AD}{DC} : \frac{BA}{DC}$

∴ BD is angle bisector

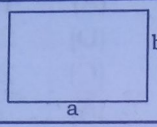
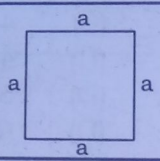
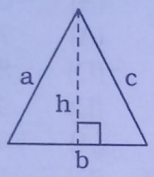
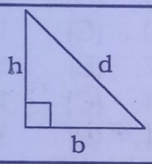
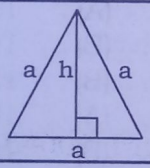
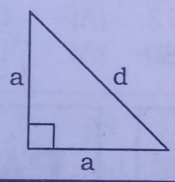
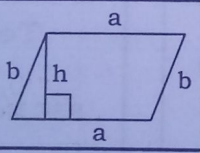
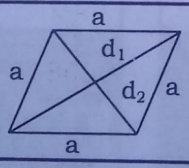
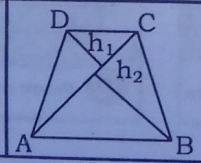
∴ DBA = 42°

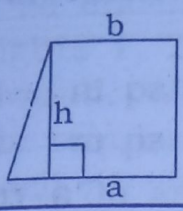
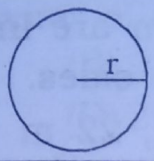
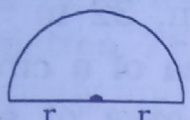
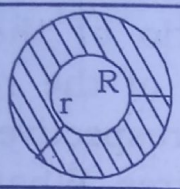
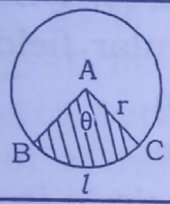
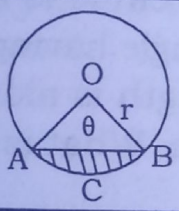
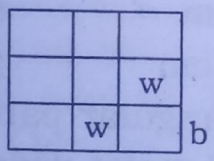
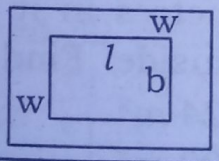
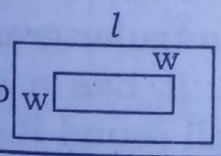
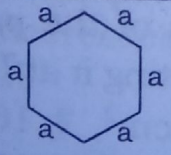
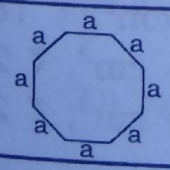
Answers-key

1.	(B)	2.	(D)	3.	(A)	4.	(C)	5.	(C)	6.	(D)	7.	(D)		
8.	(A)	9.	(B)	10.	(B)	11.	(C)	12.	(A)	13.	(A)	14.	(D)		
15.	(B)	16.	(C)	17.	(B)	18.	(A)	19.	(D)	20.	(C)	21.	(C)		
22.	(A)	23.	(C)	24.	(B)	25.	(A)	26.	(C)	27.	(A)	28.	(A)		
29.	(A)	30.	(B)	31.	(A)	32.	(D)	33.	(A)	34.	(C)	35.	(C)		
36.	(D)	37.	(B)	38.	(B)	39.	(A)	40.	(B)	41.	(A)	42.	(D)		
43.	(C)	44.	(B)	45.	(A)	46.	(A)	47.	(C)	48.	(A)	49.	(C)		
50.	(A)	51.	(B)	52.	(A)	53.	(B)	54.	(D)	55.	(A)	56.	(A)		
57.	(D)	58.	(C)	59.	(C)	60.	(B)	61.	(D)	62.	(A)	63.	(A)		
64.	(B)	65.	(B)	66.	(B)	67.	(D)	68.	(A)	69.	(C)	70.	(C)		
71.	(A)	72.	(C)	73.	(D)	74.	(B)	75.	(A)	76.	(A)	77.	(B)		
78.	(B)	79.	(B)	80.	(C)	81.	(A)	82.	(D)	83.	(A)	84.	(B)		
85.	(B)	86.	(A)	87.	(A)	88.	(A)	89.	(B)	90.	(B)	91.	(B)		
92.	(B)	93.	(A)	94.	(C)	95.	(D)	96.	(A)	97.	(A)	98.	(C)		
99.	(C)	100.	(B)	101.	(A)	102.	(C)	103.	(D)	104.	(B)	105.	(B)		
106.	(B)	107.	(B)	108.	(C)	109.	(A)	110.	(C)	111.	(A)	112.	(B)		
113.	(D)	114.	(A)	115.	(C)	116.	(B)	117.	(B)	118.	(B)	119.	(C)		
120.	(B)	121.	(C)	122.	(D)	123.	(B)	124.	(C)	125.	(A)	126.	(B)		
127.	(D)	128.	(B)	129.	(C)	130.	(A)	131.	(B)	132.	(A)	133.	(B)		
134.	(D)	135.	(C)	136.	(C)	137.	(D)	138.	(A)	139.	(C)	140.	(B)		
141.	(A)	142.	(B)	143.	(A)	144.	(A)	145.	(B)	146.	(C)	147.	(B)		
148.	(B)	149.	(D)	150.	(A)	151.	(A)	152.	(B)	153.	(B)	154.	(B)		
155.	(B)	156.	(C)	157.	(B)	158.	(D)	159.	(A)	160.	(B)	161.	(D)		
162.	(C)	163.	(A)	164.	(C)	165.	(C)	166.	(B)	167.	(A)	168.	(B)		
169.	(A)	170.	(A)	171.	(B)	172.	(A)	173.	(A)	174.	(A)	175.	(C)		
176.	(D)	177.	(A)	178.	(B)	179.	(D)	180.	(A)	181.	(A)				

20(I) MENSURATION (2-DIMENSIONAL)

CHAPTER

S. No	Name	Figure	Perimeter	Area	Nomenclature
1.	Rectangle		$2(a + b)$	$a \times b$	a = Length b = Breadth
2.	Square		$4a$	a^2	a = Side
3.	Triangle		$a + b + c = 2s$	$\frac{1}{2} \times b \times h$ or $\sqrt{s(s-a)(s-b)(s-c)}$	b is the base and h is the altitude. a, b, c are three sides of Δ. s is the semiperimeter $s = \frac{a+b+c}{2}$
4.	Right angle triangle		$b + h + d$	$\frac{1}{2} \times b \times h$	d (hypotenuse) $= \sqrt{b^2 + h^2}$
5.	Equilateral triangle		$3a$	$\frac{1}{2} \times a \times h$ or $\frac{\sqrt{3}}{4} a^2$	a = Side h = Altitude = $\frac{\sqrt{3}}{2} a$.
6.	Isosceles right angle triangle		$2a + b$	$\frac{1}{2} a^2$	d (hypotenuse) $= a\sqrt{2}$ a = Each of equal sides.
7.	Parallelo-gram		$2(a + b)$	$a \times h$ $\frac{1}{2} \times (a + b) \times h$	a = Side b = Side adjacent to a h = Distance between the parallel sides
8.	Rhombus		$4a$	$\frac{1}{2} \times d_1 \times d_2$	a = Side of rhombus, d_1, d_2 are the two diagonals.
9.	Quadrilat-eral		Sum of its four sides	$\frac{1}{2}$ (AC) $(h_1 + h_2)$	AC is one of its diagonals and h_1, h_2 are the altitudes on AC from D and B respectively.

S. No	Name	Figure	Perimeter	Area	Nomenclature
10.	Trapezium		Sum of its four sides	$\frac{1}{2} \times h \times (a + b)$	a, b are parallel sides and h is the perpendicular distance between parallel sides
11.	Circle		Circumference $= 2\pi r$	$\pi \times r^2$	r is radius of circle
12.	Semicircle		$\pi r + 2r$	$\frac{1}{2}\pi r^2$	r = Radius of the circl $\pi = \frac{22}{7}$ or 3.1416 (app.
13.	Ring (shaded region)		$2\pi(R + r)$	$\pi (R^2 - r^2)$	r = Radius of the circle R = Outher radius r = Inner radius
14.	Sector of a circle		$l + 2r$ where $l = \left(\frac{\theta}{360°}\right) \times 2\pi r$	$\left(\frac{\theta}{360°}\right) \times \pi r^2$	θ = Central angle of the sector r = Radius of the secto l = Length of the arc
15.	Segment of a circle		$\left(\frac{\theta}{360°}\right) \times 2\pi r + 2r \frac{\theta}{2}$	Area of segment ACB (Minor segment) $= r^2\left[\frac{\pi\theta}{360°} - \frac{\sin\theta}{2}\right]$	r = Radius θ = Angle subtended at the centre by the arc ACB
16.	Pathways running across the middle of a rectangle		$2(l - w) + 2(b - w)$ $= (2l + 2b - 4w)$	$w \times (l + b - w)$	l = Length b = Breadth w = Width of the patch
17.	Pathways around a rectangular field		$2[l + b + 4w]$	$2 \times w \times (l + b + 2 \times w)$	l and b are Length & Breadth of rectangular field respectively & w is width of pathways
18.	Pathways in side a rectangular field		$2[l + b - 4w]$	$2 \times w \times (l + b - 2 \times w)$	l and b are Length and Breadth of rectangular field respectively & w is width of pathways
19.	Regular Hexagon		$6a$	$\frac{3\sqrt{3}}{2}a^2$	a = each of the equal sides of a Hexagon
20.	Regular Octagon		$8a$	$2a^2(1 + \sqrt{2})$	a = each of the equal sides of a octagon

1. The area of a rectangle with length twice of breadth is 578 sq metres. What is the length of that rectangle?
(A) 34 m (B) 42 m
(C) 38 m (D) 29 m

2. What will be the area of a circle whose perimeter is 88 cm?
(A) 576 cm^2 (B) 616 cm^2
(C) 636 cm^2
(D) Can't be determined

3. The length of a rectangle, which is 25 cm is equal to the length of a square and the area of the rectangle is 125 cm less than the area of the square. What is the breadth of the rectangle?
(A) 15 cm (B) 20 cm
(C) 12 cm (D) 12 cm

4. The radii of two circles are in the ratio 4 : 5. The area of 1st field is ___ % less than the area of second one.
(A) 12% (B) 64%
(C) 36% (D) none of these

5. Poles are to be fixed along the boundary of a rectangular field in such a way that distance between any two adjacent poles is 1.5 metres. The perimeter of the field is 84 metres and length and the breadth of the field are in the ratio of 4 : 3 respectively. How many poles will be required?
(A) 50 (B) 16
(C) 15 (D) 20

6. Find the surface area of a piece of metal which is in the form of a parallelogram whose base is 10 cm and height is 6.4 cm.
(A) 64 cm^2 (B) 66 cm^2
(C) 65 cm^2 (D) 70 cm^2

7. Find the area of a rhombus one of whose diagonals measures 8 cm and the other 10 cm.
(A) 34 cm^2 (B) 36 cm^2
(C) 40 cm^2 (D) 48 cm^2

8. The perimeter of a square is 164 metres. What is the area of the square?
(A) 1089 sq m (B) 1764 sq m
(C) 1661 sq m (D) 1681 sq m

9. The sides of a rectangular field of 726 sq m are in the ratio of 3 : 2. Find the sides.
(A) 33 m, 22 m (B) 25 m, 30 m
(C) 28 m, 32 m (D) 36 m, 40 m

10. The area of a circular field is equal to the area of a rectangular field. The ratio of the length and the breadth of the rectangular field is 14 : 11 respectively and perimeter is 100 metres. What is the diameter of the circular field?
(A) 14 m (B) 22 m
(C) 24 m (D) 28 m

11. Area of circle is equal to the area of a rectangle having perimeter of 50 cm and length is more than the breadth by 3 cm. What is the diameter of the circle?
(A) 7 cm (B) 21 cm
(C) 28 cm (D) 14 cm

12. A rectangular path 100 metres long and 80 metre wide has a travel path of 8 metres in it running around it from inside. Find the area of path.
(A) 2624 m^2 (B) 2644 m^2
(C) 2602 m^2 (D) none

13. A rectangular grass plot is 112 m by 78 m. It has a gravel path 2.5 m wide all round it on the inside. Find the area of the path and the cost of constructing it at ₹ 2 per square metre?
(A) 825 cm^2, ₹ 1650
(B) 925 cm^2, ₹ 1850
(C) 1025 cm^2, ₹ 2050
(D) 1080 cm^2, ₹ 2160

14. A square field of area 31684 square metres is to be enclosed with wire placed at heights 1, 2, 3, 4 metres above the ground. What length of the wire will be required, if its length required for each circuit is 5% greater than the perimeter of the field?
(A) 2390.4 m (B) 2590.6 m
(C) 2785.8 m (D) 2990.4 m

15. Find the area of a triangle whose sides are 50 metres, 78 metres, 112 metres respectively and also find the perpendicular from the opposite angle on the side 112 metres.
(A) 1460 sq. m, 20 m
(B) 1680 sq. m, 30 m
(C) 1870 sq. m, 35 m
(D) 1880 sq. m, 40 m

16. Find the distance between the two parallel sides of a trapezium if the area of the trapezium is 250 sq. m. and the two parallel sides are equal to 15 m and 10 m respectively.
(A) 20 m (B) 25 m
(C) 30 m (D) 35 m

17. The circumference of a circular garden is 1012 m. Find the area. Outside the garden, a road of 3.5 m width runs round it. Calculate the area of this road and find the cost of gravelling it at the rate of 32 paise per sq m.
(A) 3580.50 m^2, ₹1145.76
(B) 4211.72 m^2, ₹1347.75
(C) 5486.81 m^2, ₹1755.78
(D) 6080.56 m^2, ₹1945.78

18. The length of a rectangle is increased by 60%. By what per cent should the width be decreased to maintain the same area?
(A) $33\frac{1}{2}\%$ (B) $35\frac{1}{2}\%$
(C) $37\frac{1}{2}\%$ (D) $39\frac{1}{2}\%$

19. Two poles 15 m and 30 m high stand upright in a playground. If their feet be 36 m apart, find the distance between their tops.
(A) 39 cm (B) 49 cm
(C) 59 cm (D) 69 cm

20. The area of a circle is halved when its radius is decreased by n. Find its radius.
(A) $\frac{\sqrt{2}n}{\sqrt{2}-1}$ (B) $\frac{\sqrt{3}n}{\sqrt{4}-1}$
(C) $\frac{\sqrt{4}n}{\sqrt{2}-1}$ (D) $\frac{\sqrt{2}n}{\sqrt{4}-1}$

21. A iron rod is in the form of a square enclosing an area of 22 cm^2. If the same iron rod is bent into a circle, then find the area of that circle.
(A) 24 cm^2 (B) 26 cm^2
(C) 28 cm^2 (D) 30 cm^2

22. In a quadrilateral, the length of one of its diagonal is 23 cm and the perpendiculars drawn on this diagonal from other two vertices measure 17 cm and 7 cm respectively. Find the area of the quadrilateral
(A) 272 sq. cm (B) 273 sq. cm
(C) 274 sq. cm (D) 276 sq. cm

23. The ratio of the areas of the in-circle and the circum-circle of a square is
(A) 1 : 2 (B) $\sqrt{2}$: 1
(C) 1 : $\sqrt{2}$ (D) 2 : 1

24. The area of an equilateral triangle inscribed in a circle is $4\sqrt{3}$ cm^2. The area of the circle is
(A) $\frac{16}{3}\pi$ cm^2 (B) $\frac{22}{3}\pi$ cm^2
(C) $\frac{28}{3}\pi$ cm^2 (D) $\frac{32}{3}\pi$ cm^2