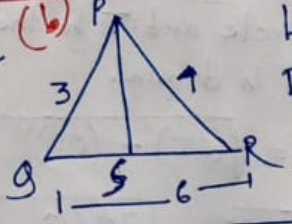
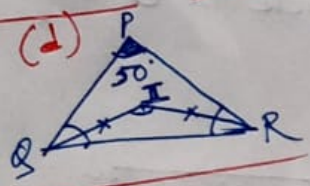
GEOMETRY [PART-I] (ANSWERS)

1. (c) Area of the triangle GFB $= \frac{\text{Area of } \triangle ABC}{6} = \frac{24}{6} = \boxed{4 \text{ sq.cm}}$

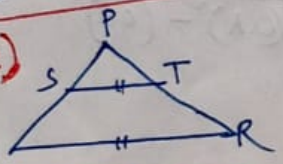
2. (c) $\frac{AB}{AC} = \frac{BD}{DC} \Rightarrow BD = \left(\frac{AB}{AC} \times DC\right) = \left(\frac{10}{12} \times 8\right) = \boxed{6\frac{2}{3} \text{ cm}}$

3. (b) 

Let PS be the median from P to QR.
By Apollonius theorem; $2(PS^2 + QS^2) = PQ^2 + PR^2$
$\therefore PS^2 = \frac{(3)^2 + (4)^2}{2} - \left(\frac{6}{2}\right)^2 = 3.5$
$PS = \boxed{\sqrt{3.5} \text{ cm}}$

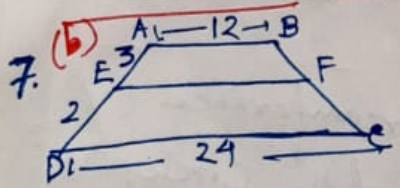
4. (d) 

$\therefore \angle QIR = \left(90° + \frac{\angle QPR}{2}\right) = \left(90° + \frac{50°}{2}\right) = \boxed{115°}$

5. (c) 

As ST ∥ QR; $\frac{PS}{SQ} = \frac{PT}{TR}$
$\Rightarrow PT = \left(\frac{PS}{SQ}\right) \times TR = \left(\frac{8}{4} \times 6\right) = \boxed{12 \text{cm}}$

6. (b) As PQRS is a cyclic quadrilateral.
$\therefore \angle R = (180° - \angle P) = 130°$; $\angle S = 180° - \angle Q = 110°$
$\therefore \angle R - \angle S = \boxed{20°}$

7. (b) 

$\therefore EF = \frac{2}{5} CD + \frac{3}{5} AB$
$= \left(\frac{3}{5} \times 24\right) + \left(\frac{3}{5} \times 12\right) = \boxed{16.8 \text{ cm}}$

8. (d) Number of diagonals $= \frac{n(n-3)}{2}$ [$\because$ Here n = side]
$= \left(\frac{10 \times 7}{2}\right) = \boxed{35}$

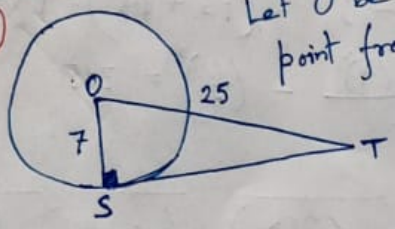
GEOMETRY (PART-I) [ANSWERS]

9. (a) As AC and AE are Secants; Let AD = x cm

$\therefore AB \times AC = AD \times AE \Rightarrow 2 \times 24 = x(x+8)$

By option test; option (a) satisfies the above expression. The Required answer is AD = 4 cm

10. (b)

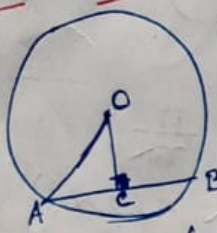


Let O be the centre of the circle and T be the point from which the tangent is drawn.

Length of the tangent $= \sqrt{(OT)^2 - (OS)^2}$

$= \sqrt{(25)^2 - (7)^2} = 24$ cm

11. (a)



Let the centre of the circle be O and chord be AB.

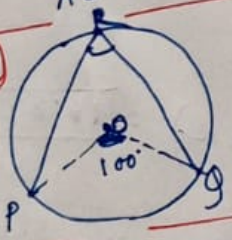
Now; $OC \perp AB$.

$\therefore (OA)^2 = (OC)^2 + (AC)^2 \Rightarrow AC = \sqrt{(OA)^2 - (OC)^2}$

$AC = \sqrt{(15)^2 - (9)^2} = 12$ cm.

$AB = 2AC = 24$ cm

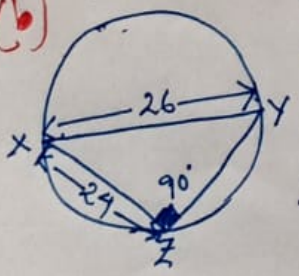
12. (d)



$\therefore \angle POQ = 2\angle PRQ$

$\angle PRQ = \frac{\angle POQ}{2} = 50°$

13. (b)



As Z is a point on the circumference and XY is the diameter of the circle;

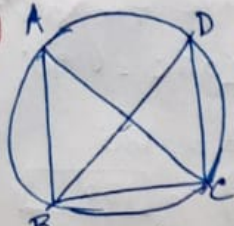
$\angle XZY = 90°$

$\therefore YZ = \sqrt{(XY)^2 - (ZY)^2} = \sqrt{(26)^2 - (24)^2} = 10$

$YZ = 10$ cm

GEOMETRY [PART-I] (ANSWERS)

14. (d)

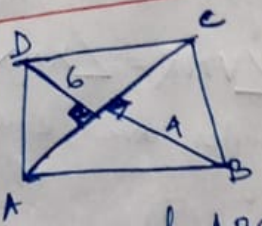


$\angle BAC = \angle BDC = 50^\circ$ (∵ Angles in the same segment are equal)

In the triangle ABC; $\angle ABC + \angle BAC + \angle BCA = 180^\circ$

$\Rightarrow \angle ABC = 180^\circ - (\angle BAC + \angle BCA) = \{180^\circ - (50^\circ + 45^\circ)\} = \boxed{85^\circ}$

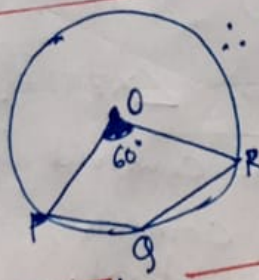
15. (c)



Area of ABCD = Area of triangle ABC + Area of triangle ACD

$\therefore$ Area of ABCD $= \left\{\left(\frac{1}{2} \times 4 \times 12\right) + \left(\frac{1}{2} \times 6 \times 12\right)\right\} = \boxed{60 \text{ sq.cm}}$

16. (c)

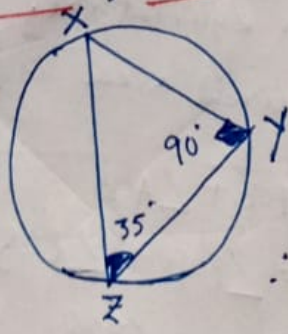


$\therefore$ Reflex $\angle POR = 300^\circ$

$2\angle PQR$ = Reflex $\angle POR$

$\therefore \angle PQR = \left(\frac{300}{2}\right) = \boxed{150^\circ}$

17. (b)



As XZ is the diameter of the circle.

$\angle XYZ = 90^\circ$

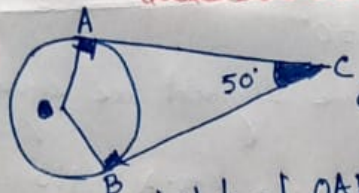
In $\triangle XYZ$; $\angle YXZ + \angle XYZ + \angle YZX = 180^\circ$

$\therefore \angle YXZ = 180^\circ - (\angle XYZ + \angle XZY)$

$= 180^\circ - (90^\circ + 35^\circ)$

$= \boxed{55^\circ}$

18 (a)

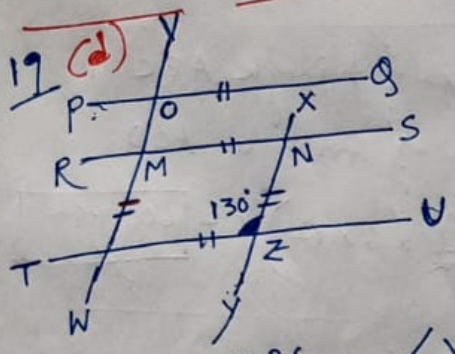


As AC and BC are tangents to the circles; $\angle OAC = \angle OBC = 90^\circ$

$\therefore$ In quadrilateral OABC; $\angle AOB + \angle ACB = 180^\circ$

$\Rightarrow \angle AOB = (180^\circ - 50^\circ) = \boxed{130^\circ}$

19 (d)



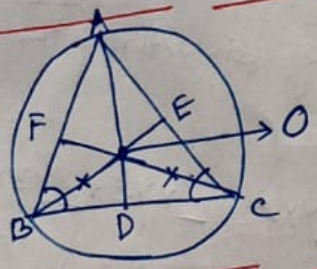
As; RS ∥ TU; $\angle XZT = \angle XNR \rightarrow$ (i)
(Corresponding angles are equal)

As, VW ∥ XY; $\angle VMR = \angle XNR \rightarrow$ (ii)
(Corresponding angles are equal)

As; PQ ∥ RS; $\angle VOP = \angle VMR \rightarrow$ (iii)
(Corresponding angles are equal)

From (i); (ii) and (iii) $\rightarrow \angle VOP = \angle XZT = \boxed{130^\circ}$

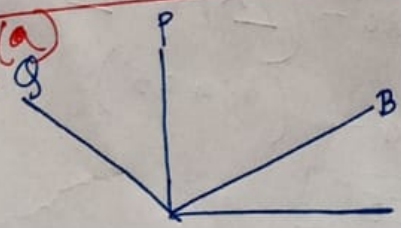
20. (d)



The incentre, the centroid and the circumcentre coincide; since the triangle is equilateral.

$\therefore$ The required area is $\boxed{0}$.

21. (a)



$\angle POA = \angle POB + \angle AOB$

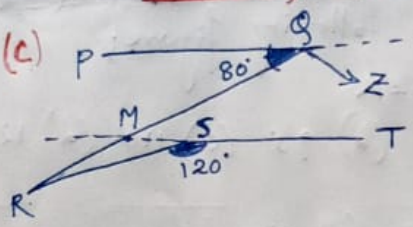
also; $\angle BOQ = \angle POB + \angle POQ$

Since; $\angle POA = \angle BOQ$

$\therefore \angle POB + \angle AOB = \angle POB + \angle POQ$

$\Rightarrow \angle AOB = \angle POQ$; $\therefore \angle POQ = \boxed{20^\circ}$

22. (c)



Join S and M.

$\angle RSM = (180^\circ - 120^\circ) = 60^\circ$

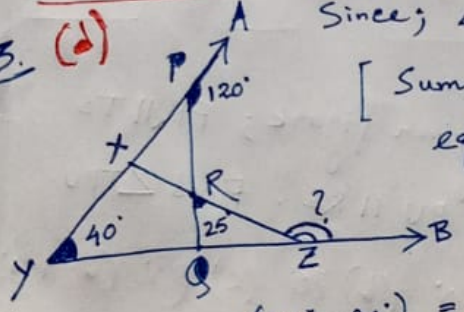
$\therefore \angle QMT = \angle PQR = 80^\circ$ (Alternate angles always equal)

$\therefore \angle RMS = (180^\circ - 80^\circ) = 100^\circ$

$\therefore \angle SRM = \{180^\circ - (60^\circ + 100^\circ)\} = 20^\circ$

$\therefore \angle RQZ = (2 \times 20^\circ) = \boxed{40^\circ}$

23. (d)



Since; $\angle PQY + \angle PYQ = \angle QPA$

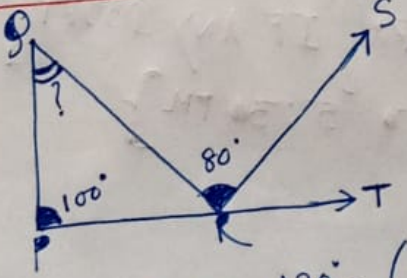
[Sum of the interior angles of a triangle is equal to the exterior opposite angles]

$\therefore \angle PQY = 120^\circ - 40^\circ = 80^\circ$

$\therefore \angle ZQR = (180^\circ - 80^\circ) = 100^\circ$

$\therefore \angle BZX = (\angle ZQR + \angle ZRQ) = (100^\circ + 25^\circ) = \boxed{125^\circ}$

24. (b)



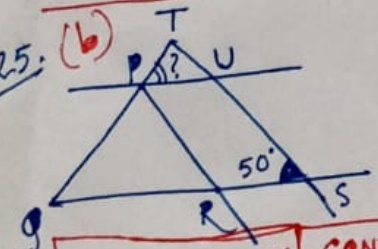
$\angle PRQ + \angle QRS + \angle SRT = 180^\circ$

$\Rightarrow 2\angle PRQ = 180^\circ - 80^\circ$ [Since; $\angle PRQ = \angle SRT$]

$\Rightarrow \angle PRQ = \left(\frac{100^\circ}{2}\right) = 50^\circ$

$\therefore \angle PQR = 180^\circ - (100^\circ + 50^\circ) = \boxed{30^\circ}$

25. (b)



Since PUSR is a parallelogram;

$\angle UPR = 50^\circ$

$\therefore \angle TPU = 180^\circ - \angle QPU = 180^\circ - (\angle QPR + \angle UPR)$

$= \{180^\circ - (60^\circ + 50^\circ)\}$

$= \boxed{70^\circ}$