DAE / IA – 2017/08
MATH 113 APPLIED MATHEMATICS – I
PAPER – B (Part – B)

Q.2 Write short answers to any eighteen from the following questions:

1. Find the area of a triangle whose adjacent sides are 16cm and 12cm and their included angle is 30°.

Sol. $a = 16cm\ ,\ b = 12cm\ ,\ \theta = 30°$

$$Area\ of\ \Delta = \frac{1}{2}ab\sin\theta$$
$$= \frac{1}{2}(16)(12)\sin 30$$
$$= 8 \times 12 \times \frac{1}{2} = 48\,sq.cm$$

2. What is the side of the equilateral triangle whose area is $9\sqrt{3}\ sq.m$.

Sol.

$Area = 9\sqrt{3}\ sq.cm\ ,\ a = each\ side\ of\ eq.\Delta = ?$

$$Area\ of\ eq.\Delta = \frac{\sqrt{3}}{4}a^2$$
$$9\sqrt{3} = \frac{\sqrt{3}}{4}a^2$$
$$9\sqrt{3} \times \frac{4}{\sqrt{3}} = a^2 \Rightarrow a^2 = 36 \Rightarrow a = 6cm$$

3. Find the area of trapezoid whose parallel sides are 20cm and 30cm and perpendicular distance between them is 4cm.

Sol. $a = 20cm\ ,\ b = 30cm$

$Perpendicular\ distance = 4cm$

$$\text{Area of trapezoid} = \left(\frac{a+b}{2}\right) \times \text{Perpendicular distance}$$
$$= \left(\frac{20+30}{2}\right) \times 4 = 50 \times 2$$
$$= 100\,sq.cm$$

4. Define a cyclic quadrilateral and write its area.

Sol. A Quadrilateral inscribed in a circle so that its corner touches the boundary of the circle is called cyclic quadrilateral.
Let a,b,c,d be the side of a cyclic quadrilateral and if: $S = \frac{a+b+c+d}{2}$ then:

$$Area\ of\ cyclic\ quadrilateral = \sqrt{(S-a)(S-b)(S-c)(S-d)}$$

5. Define circumscribed polygon.

Sol. If a polygon is drawn outside the circle so that circle touches every side of polygon, then the polygon is called circumscribed polygon and circle is called inscribed circle.

6. Find the interior angle of hexagon.

Sol. $For\ hexagon,\ n = 6$

$$Interior\ angle\ of\ Hexagon = \frac{2n-4}{n} \times 90°$$
$$= \frac{2(6)-4}{6} \times 90°$$
$$= \frac{8}{6} \times 90°$$
$$= 4 \times 30°$$
$$= 120°$$

7. Find the radius of a circle the area of which is 9.3129 sq.cm.

Sol. $Area\ of\ circle = 9.3129\,sq.cm$

$Radius = r = ?$

$$Area\ of\ a\ circle = \pi r^2$$
$$9.3129 = (3.14)r^2$$
$$r^2 = \frac{9.3129}{3.14} = 2.96$$
$$r = 1.72\,cm$$
$$Perimeter\ of\ the\ circle = 2\pi r$$
$$= 2(3.14)(1.72)$$
$$= 10.80\,cm$$

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