

Math 113 Key Book Download

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. $a = 16\text{cm}$, $b = 12\text{cm}$, $\theta = 30^\circ$

$$\text{Area of } \Delta = \frac{1}{2} ab \sin \theta$$

$$= \frac{1}{2} (16)(12) \sin 30$$

$$= 8 \times 12 \times \frac{1}{2} = 48 \text{sq.cm}$$

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

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

$$\text{Area of eq. } \Delta = \frac{\sqrt{3}}{4} a^2$$

$$9\sqrt{3} = \frac{\sqrt{3}}{4} a^2$$

$$9\sqrt{3} \times \frac{4}{\sqrt{3}} = a^2 \Rightarrow a^2 = 36 \Rightarrow a = 6 \text{cm}$$

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

Sol. $a = 20\text{cm}$, $b = 30\text{cm}$
Perpendicular distance = 4cm

$$\text{Area of trapezoid} = \left(\frac{a+b}{2}\right) \times \text{Perpendicular distance}$$

$$= \left(\frac{20+30}{2}\right) \times 4 = 50 \times 2$$

$$= 100 \text{sq.cm}$$

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:

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

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 $n = 6$

$$\text{Interior angle of Hexagon} = \frac{2n-4}{n} \times 90^\circ$$

$$= \frac{2(6)-4}{6} \times 90^\circ$$

$$= \frac{8}{6} \times 90^\circ$$

$$= 4 \times 30^\circ$$

$$= 120^\circ$$

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

Sol. $\text{Area of circle} = 9.3129 \text{sq.cm}$
 $\text{Radius} = r = ?$

$$\text{Area of a circle} = \pi r^2$$

$$9.3129 = (3.14)r^2$$

$$r^2 = \frac{9.3129}{3.14} = 2.96$$

$$r = 1.72 \text{cm}$$

$$\text{Perimeter of the circle} = 2\pi r$$

$$= 2(3.14)(1.72)$$

$$= 10.80 \text{cm}$$

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Provides students with a quick and easy overview of basic mathematics topics that are useful for a variety of disciplines including, but not limited to: civil engineering, electrical engineering, computer engineering, communication systems engineering, and others. This is a revised and updated version of the edition that was published in 2013. Math 113 students can expect to complete the course in 6-8 weeks. All students should start with the same content: 1) basic algebra, 2) real numbers, 3) functions, 4) simple graphs, and 5) inequalities. They should also expect to finish with: 1) basic trigonometry, 2) logarithms, 3) graphs of complex numbers, 4) vectors and matrices, and 5) matrix inequalities. From this starting point, students are introduced to a variety of topics in technical mathematics by problem solving. After the initial set of mathematical problems are complete, students are introduced to more advanced topics in a separate chapter devoted to each. Students are introduced to: 1)

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