

# Properties of Triangle

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## I. FILL IN THE BLANKS

- 1) In a  $\triangle ABC$ ,  $\angle A = 90^\circ$  and  $AD$  is an altitude. Complete the relation

$$\frac{BD}{BA} = \frac{AB}{(\dots)} \quad (1980)$$

- 2)  $ABC$  is a triangle,  $P$  is a point on  $AB$ , and  $Q$  is point on  $AC$  such that  $\angle AQP = \angle ABC$ . Complete the relation

$$\frac{\text{area of } \triangle APQ}{\text{area of } \triangle ABC} = \frac{(\dots)}{AC^2} \quad (1980)$$

- 3)  $ABC$  is a triangle with  $\angle B$  greater than  $\angle C$ .  $D$  and  $E$  are the points on  $BC$  such that  $AD$  is perpendicular to  $BC$  and  $AE$  is the bisector of angle  $A$ . Complete the relation

$$\angle DAE = \frac{1}{2}[\angle B - \angle C] \quad (1980)$$

- 4) the set of all real numbers  $a$  such that  $a^2 + 2a$ ,  $2a + 3$  and  $a^2 + 3a + 8$  are the sides of a triangle is ..... (1985 - 2 Marks)

- 5) In a triangle  $ABC$ , if  $\cot A, \cot B, \cot C$  are in A.P., then  $a^2, b^2, c^2$  are in ..... progression (1985 - 2 Marks)

- 6) A polygon of nine sides, each of length 2, is inscribed in a circle. The radius of the circle is ..... (1987 - 2 Marks)

- 7) If the angles of a triangle are  $30^\circ$  and  $45^\circ$  and the included side is  $(\sqrt{3} + 1)$  cms, then the area of the triangle is ..... (1988 - 2 Marks)

- 8) If the triangle  $ABC$ ,  $\frac{2 \cos A}{a} + \frac{2 \cos B}{b} + \frac{2 \cos C}{c} = \frac{a}{bc} + \frac{b}{ac}$ , then the value of the angle  $A$  is ..... degrees. (1993 - 2 Marks)

- 9) In the triangle  $ABC$ ,  $AD$  is the altitude from  $A$ . Given  $b > c$ ,  $\angle C = 23^\circ$  and  $AD = \frac{abc}{b^2 - c^2}$

then  $\angle B = \dots\dots\dots$  (1994 - 2 Marks)

- 10) A circle is inscribed in an equilateral triangle of a side  $a$ . The area of any square inscribed in this circle is ..... (1994 - 2 Marks)

- 11) In a triangle  $ABC$ ,  $a : b : c = 4 : 5 : 6$ . The ratio of the radius of the circumferences to that of the incircle is ..... (1996 - 1 Marks)

## II. MCQ WITH ONE CORRECT ANSWER

- 1) If the bisector of the angle  $P$  of a triangle  $PQR$  meets  $QR$  in  $S$ , then

- (a)  $QS = SR$   
(b)  $QS : SR = PR : PQ$   
(c)  $QS : SR = PQ : PR$   
(d) None of these (1979)

- 2) From the top of a light-house 60 meter high with its base at the sea level the angle of depression of a boat is  $15^\circ$ . The distance of the boat from the foot of the light house.

- (a)  $\left(\frac{\sqrt{3}-1}{\sqrt{3}+1}\right) 60 \text{ metres}$   
(b)  $\left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right) 60 \text{ metres}$   
(c)  $\left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right)^2 60 \text{ metres}$   
(d) none of these (1983 - 2 Marks)

- 3) In the triangle  $ABC$ , angle  $A$  is the greater than angle  $B$ . If the measures of the angles  $A$  and  $B$  satisfies the equation  $3 \sin x - 4 \sin^3 x - k = 0$ ,  $0 < k < 1$ , then the measure of the angle  $C$  is

- (a)  $\frac{\pi}{3}$   
(b)  $\frac{\pi}{2}$   
(c)  $\frac{2\pi}{3}$   
(d)  $\frac{5\pi}{6}$  (1990 - 2 Marks)

- 4) If the lengths of the sides of triangles are 3, 5, 7 then the largest angles of the triangle is

- (a)  $\frac{\pi}{2}$   
(b)  $\frac{5\pi}{6}$   
(c)  $\frac{2\pi}{3}$   
(d)  $\frac{3\pi}{4}$  (1994)