

# 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  $\frac{\text{area of } \triangle APQ}{\text{area of } \triangle ABC} = \frac{(\dots)}{AC^2}$  (1980)
  - 3)  $ABC$  is a triangle with  $\angle B$  greater than  $\angle C$  and  $D$  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  $\angle DAE = \frac{1}{2}[\angle B - \angle C]$  (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  $\angle B = \dots$  (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)
- a)  $\frac{QS}{SR} = \frac{PR}{PQ} : \frac{PQ}{PR}$  : these (1979)
  - b)  $\frac{QS}{SR} : \frac{QS}{SR} : \frac{QS}{SR}$  : d) None of
- 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)  $\left(\frac{\sqrt{3}-1}{\sqrt{3}+1}\right) 60 \text{ metres}$  c)  $\left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right)^2 60 \text{ metres}$   
 b)  $\left(\frac{\sqrt{3}+1}{\sqrt{3}-1}\right) 60 \text{ metres}$  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)  $\frac{\pi}{3}$  c)  $\frac{2\pi}{3}$   
 b)  $\frac{\pi}{2}$  d)  $\frac{5\pi}{6}$   
 (1985 - 2 Marks)
  - 4) If the lengths of the sides of triangles are 3, 5, 7 then the largest angles of the triangle is  
 a)  $\frac{\pi}{2}$  c)  $\frac{2\pi}{3}$   
 b)  $\frac{5\pi}{6}$  d)  $\frac{3\pi}{4}$   
 (1986 - 2 Marks)

## II. MCQ WITH ONE CORRECT ANSWER

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