# Paper – 1 (Properties of Triangle)

1. In a ΔABC, the value of $a^2(\sin^2 B - \sin^2 C) + b^2(\sin^2 C - \sin^2 A) + c^2(\sin^2 A - \sin^2 B)$ is equal to
   (a) $2\Sigma a^2 b^2$ (b) $2(a^2 + b^2 + c^2)$
   (c) $(a + b + c)^2$ (d) 0
2. If the sides of a triangle are $3 + \sqrt{3}, 2\sqrt{3}$ and $\sqrt{6}$, then the difference of the greatest angle and the least angle is:
   (a) $60^o$ (b) $75^0$
   (c) $15^o$ (d) None of these
3. In a ΔABC, $\Sigma a(\sin B - \sin C)$ is equal to
   (a) $a + b + c$ (b) $a^2 + b^2 + c^2$
   (c) 0 (d) None of these
4. If $a \cos A = b \cos B$, then the triangle is :
   (a) Equilateral (b) Right Angle
   (c) Isosceles (d) Isosceles or right angled
5. If twice the square of the diameter of a circle is equal to half the sum of the squares of the sides of inscribed triangle ABC, then $\sin^2 A + \sin^2 B + \sin^2 C$ is equal to
   (a) 1 (b) Data is inconsistent
   (c) 4 (d) none of these
6. In a ΔABC, $b \cos^2 \frac{C}{2} + c \cos^2 \frac{B}{2} = \lambda s$, where $2s$ is the perimeter of the Δ, then $\lambda =$
   (a) 1 (b) 2
   (c) 1/2 (d) None
7. In a ΔABC, for any real angle $\theta$, $b \cos(C - \theta) + c \cos(B + \theta) =$
   (a) $a \cos \theta$ (b) $b \cos \theta$
   (c) $c \cos \theta$ (d) None of these
8. If $\frac{\sin A}{\sin C} = \frac{\sin(A-B)}{\sin(B-C)}$, then $a^2, b^2, c^2$ are in
   (a) AP (b) GP
   (c) HP (d) None of these
9. $\Sigma a^3 \cos(B - C) =$
   (a) 3*abc* (b) 3(*a*+*b*+*c*)
   (c) *abc*(*a*+*b*+*c*) (d) 0
10. In ΔABC, $\frac{b^2 \sin 2C + c^2 \sin 2B}{\Delta}$, where Δ is the area of the ΔABC, is equal to
    (a) 1 (b) 2 (c) 3 (d) 4