CTQ - 2023

CTQ : Concept Through Questions **Year : 2023**

Topic : Properties of triangle

1. In a triangle ABC, R is circumradius and $8R^2 = a^2 + b^2 + c^2$. The triangle ABC is:
   (a) Acute angled (b) Obtuse angled
   (c) Right angled (d) none of these Video Solution
   [NIMCET 2010]

2. In a ΔABC, $(c + a + b)(a + b - c) = ab$. The measure of the angle C is.
   (a) $\pi/3$ (b) $\pi/6$
   (c) $2\pi/3$ (d) None of these Video Solution
   [NIMCET 2013]

3. A man observes the angle of elevation of the top of mountain to be 30o. He walks 1000 feet nearer and finds the angle of elevation to be 45o. What is the distance of the first point of observation from the foot of the mountain?
   (a) $500\sqrt{3}(\sqrt{3}+1)$ft (b) $500(\sqrt{3}+1)$ft
   (c) $500(\sqrt{3}-1)$ ft (d) $500\sqrt{3}(\sqrt{3}-1)$ft Video Solution
   [NIMCET 2013]

4. Let ΔABC be a triangle whose area is $10\sqrt{3}$ units with side lengths |AB|= 8 units and |AC|=5 units. Find possible values of the angle A.
   (a) 60o or 1200 (b) 450 or 1350
   (c) 300 only (d) 900 only Video Solution
   [NIMCET 2013]

5. In ΔABC, if a = 2, b = 4 and ∠C=60°, then A and B are respectively equal to
   (a) 90°, 30° (b) 45°, 75°
   (c) 60°, 60° (d) 30°, 90° Video Solution
   [NIMCET 2014]

6. If A, B and C is three angles of a ΔABC, whose area is Δ. Let a, b and c be the sides opposite to the angles A, B and C respectively. If $s = \frac{a+b+c}{2} = 6$, then the product $\frac{1}{3}s^2(s-a)(s-b)(s-c)$ is equal to
   (a) 2Δ (b) $2\Delta^2$
   (c) $\sqrt{2}\,\Delta$ (d) Δ^2 Video Solution
   [NIMCET 2014]

7. From three collinear points A, B and C on a level ground which can be on the same side of a tower, the angles of elevation of the top of the tower are 30°, 45° and 60°, respectively. If BC=60m, then AB is
   (a) $15\sqrt{3}$ (b) $30\sqrt{3}$
   (c) $45\sqrt{3}$ (d) $60\sqrt{3}$ Video Solution

[NIMCET 2014]

8. If the angles of a triangle are in the ratio 2 : 3 : 7, then the ratio of the sides opposite to these angles is
   (a) $\sqrt{2}: 2: \sqrt{3}+1$ (b) $2: \sqrt{2}: \sqrt{3}+1$
   (c) $2: \sqrt{2}: \frac{\sqrt{2}}{\sqrt{3}-1}$ (d) $\frac{1}{\sqrt{2}}: 2: \frac{\sqrt{3}+1}{2}$ Video Solution

[NIMCET 2015]

9. A harbor lies in a direction 60° South of West from a fort and at a distance 30 km from it, a ship sets out from the harbour at noon and sails due East at 10 km an hour. The time at which the ship will be 70 km from the fort is
   (a) 7 pm (b) 8 pm
   (c) 5 pm (d) 10 pm Video Solution

[NIMCET 2015]

10. Two towers face each other separated by a distance of 25 m. As seen from the top of the first tower, the angle of depression of the second tower's base is 60° and that of the top is 30°. The height (in meters) of the second tower is
    (a) $50/\sqrt{3}$ (b) $25/\sqrt{3}$
    (c) 50 (d) $25\sqrt{3}$ Video Solution

[NIMCET 2015]

11. A circus artist is climbing a 20m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is 30^0.
    (a) 10m (b) 20m
    (c) 30m (d) 40m Video Solution

[NIMCET 2016]

12. In a triangle ABC, a=4, b=3, ∠BAC=60°, then the education for which c is the root, is
    (a) $c^2+3c+7=0$ (b) $c^2+3c-7=0$
    (c) $c^2-3c-7=0$ (d) $c^2+3c-7=0$ Video Solution

[NIMCET 2016]

13. If a twelve sided regular polygon is inscribed in a circle of radius 3 centimeters, then the length of each side of the polygon is
    (a) 3 (b) $18-9\sqrt{3}$
    (c) $18+9\sqrt{3}$ (d) $9\left(1-\sqrt{3}\right)$ Video Solution

[NIMCET 2016]

14. What is the largest area of an isosceles triangle with two edges of length 3?
    (a) 3 (b) 3/2
    (c) 9 (d) 9/2 Video Solution

[NIMCET 2017]

15. In a triangle ABC, let ∠C = π/2. If r is the in-radius and R is circumradius of the triangle ABC, then 2(r + R) equals
    (a) a + c (b) a + b + c
    (c) a + b (d) b + c Video Solution

[NIMCET 2017]

16. If in a triangle ABC, the altitudes from the vertices A, B, C on opposite sides are in HP, then sin A, sin B, sin C are in
(a) HP (b) Arithmetic – Geometric progression
(c) AP (d) GP Video Solution

17. In a triangle ABC, $\angle A = 90^0$ and D is the mid – point of AC. The value of $BC^2 - BD^2$ is equal to
(a) AD^2 (b) $2AD^2$
(c) $3AD^2$ (d) $4AD^2$ Video Solution
[NIMCET 2018]

18. If $\Delta = a^2 - (b-c)^2$, where Δ is the area of the ΔABC, then $tan\ A$ equals
(a) 15/16 (b) 8/15
(c) 8/17 (d) 1/2 Video Solution
[NIMCET 2019]

19. Angle of elevation of the top of the tower from 3 points (collinear) A, B and C on a road leading to the foot of the tower are 30°, 45° and 60°, respectively. The ratio of AB : BC is
(a) √3:1 (b) √3:2
(c) 1 : 2 (d) 2:√3 Video Solution
[NIMCET 2022, 2020]

20. In a triangle ABC $a\cos^2\frac{C}{2} + c\cos^2\frac{A}{2} = \frac{3b}{2}$, then the sides of the triangle are in
(a) AP (b) GP
(c) HP (d) None of the above Video Solution
[NIMCET 2021]

21. In a triangle, if the sum of two sides is x and their product is y such that (x+z)(x-z)=y, where z is the third side of the triangle , then triangle is
(a) equilateral (b) Right angled
(c) Isosceles (d) Obtuse angled Video Solution
[NIMCET 2021]

22. If the angle of elevation of the top of a hill from each of the vertices A, B and C of a horizontal is a, then the height of the hill is
(a) $\frac{1}{2}b\tan\alpha\sec B$ (b) $\frac{1}{2}b\tan\alpha\,cosec\,A$
(c) $\frac{1}{2}c\tan\alpha\sin C$ (d) $\frac{1}{2}a\tan\alpha\,cosec\,A$ Video Solution
[NIMCET 2022]

Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	C	C	A	A	D	B	D	A	B	A
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	A	C	B	D	C	C	C	B	A	A
Ques.	21	22								
Ans.	D	D								