Geometry – Triangles

1. Consider ΔABD such that $\angle ADB = 20°$ and C is a point on BD such that AB = AC and CD = CA. What is the measure of $\angle ABC$

   a) 45° b) 60° c) 30° d) 40°

2. In ΔABC, ∠A + ∠B = 65°, ∠B + ∠C = 140°, then find ∠B.

   a) 40° b) 25° c) 35° d) 20°

3. ABC is a triangle. The bisectors of the internal angle $\angle B$ and external angle $\angle C$ intersect at D. If angle $\angle BDC = 50°$, then what is $\angle A$?

   a) 100° b) 90° c) 120° d) 60°

4. In a triangle ABC, ∠A = 90°, ∠C = 55° AD ⊥ BC. What is the value of ∠BAD?

   a) 35° b) 60° c) 45° d) 55°

5. In a triangle ABC, AB = AC, ∠BAC = 40°. Then the external angle at B is

   a) 90° b) 70° c) 110° d) 80°

6. Let BE and CF be the two medians of a ΔABC and G be their intersection. Also let EF cut AG at O. Then AO : OG is_

   a) 1:1 b) 1:2 c) 2:1 d) 3:1

7. In a triangle, if three altitudes are equal then the triangle is

   a) Obtuse b) Equilateral c) Right d) Isosceles

8. If the ratio of areas of two similar triangles is 9:16, then the ratio of their corresponding sides is_

a) 3:5 b) 3:4 c) 4:5 d) 4:3

9. In an obtuse-angled triangle ABC, $\angle A$ is the obtuse angle and H is the orthocenter. If $\angle BHC$ = 54° then $\angle BAC$ is_

a) 108° b) 126° c) 136° d) 116°

10. If G is the centroid of ΔABC and Δ ABC = 48 cm², then the area of Δ BGC is

a) 32 cm² b) 8 cm² c) 16 cm² d) 24 cm²

11. If S is the circumcentre of ΔABC and ∠A = 50° then what is the value of ∠BCS

a) 40° b) 35° c) 110° d) 55°

12. I and O are respectively the in-centre and circumcentre of a triangle ABC. The line A1produced intersects the circumcircle of ΔABC at the point D. If ∠ABC = x°, ∠BID = y° and ∠BOD = z°, then (z + x)/y =?

a) 3 b) 1 c) 2 d) 4

13. If S is the circumcentre of ΔPQR and ∠QSR = 110° and ∠SPR = 25° then find ∠PRQ

a) 60° b) 75° c) 120° d) 105°

14. In a right-angled triangle ABC, $\angle B$=90°, AB=5cm and BC=12cm. Find the radius of the circumcircle and the length BD, Where D is the midpoint of AC.

a) 7.5cm, 6.5cm b) 6.5cm, 6.5cm

c) 8.2cm, 6.5cm d) 9.5cm, 6.5cm

15. If I is in the centre of ΔABC and $\angle A$=60°, then the value $\angle BIC$ is _

a) 100° b) 120° c) 150° d) 110°

16. The external bisectors of $\angle B$ and $\angle C$ of ΔABC meet at point P. If $\angle BAC$=80°, then $\angle BPC$ is_

a) 50° b) 40° c) 80° d) 100°

17. The height of an equilateral triangle is 15 cm. The area of the triangle is –

a) 50 3 sq. cm b) 70 3 sq. cm

c) 75 3 sq. cm d) 150 3 sq. cm

18. In ΔABC, DE ‖AC. D and E are two points on AB and CB respectively. If AB = 10 cm and AD = 4cm then BE : CE is –

a) 2:3 b) 2:5 c) 5:2 d) 3:2

19. The sum of three altitudes of a triangle is –

a) equal to the sum of three sides b) less than the sum of sides

c) greater than the sum of sides d) twice the sum of sides

20. ABC is an isosceles triangle such that AB = AC and ∠B = 35°, AD is the median to the base BC. Then ∠BAD is

a) 70° b) 35° c) 110° d) 55°

Answers

1 – d	2 - b	3 - a	4 - d	5 - c	6 - d	7 - b	8 - b	9 - b	10 - c
11 - a	12 - a	13 - a	14 - b	15 - b	16 - a	17 - c	18 - d	19 - b	20 - d

Additional Examples

1. If I be the incentre of Δ ABC and ∠B = 70° and ∠C = 50°, then the magnitude of ∠BIC is

a) 130° b) 60° c) 120° d) 105°

2. In ΔPQR, the line drawn from the vertex P intersects QR at a point S. If QR = 4.5 cm and SR = 1.5 cm then the ratios of the area of ΔPQS and ΔPSR is

a) 4:1 b) 3:1 c) 3:2 d) 2:1

3. If two medians BE and CF of a ΔABC, intersect each other at G and if BG = CG, ∠BGC = 60° and BC = 8 cm. Then area of the ΔABC is

a) 48cm² b) $64\sqrt{3}$ cm² c) $96\sqrt{3}$ cm² d) $48\sqrt{3}$ cm²

4. ABC is a cyclic triangle and the bisectors of ∠BAC, ∠ABC and ∠BCA meet the circle at P, Q and R respectively. The exterior angle bisector of ∠BAC and ∠ACB meet at M. If ∠AMC = 60^o, then the ∠RIB is

a) 45° b) 75^o c) 60° d) 30°

5. Given that, ΔABC ~ΔPQR, ΔABC and ΔPQR are right angle triangle, $\frac{\text{area }(\Delta PQR)}{\text{area }(\Delta ABC)} = \frac{49}{441}$ and PR = 5cm. If AC is the hypotenuse, what is the radius of the circumcentre of the ΔABC?

a) 15.5 cm b) 16cm c) 15 cm d) 7.5 cm

6. ABC is an equilateral triangle and CD is the internal bisector of ∠C. If DC is produced to E such that AC = CE, then what is ∠AOE if O is the orthocenter of the ΔACE?

a) 45° b) 75° c) 30° d) 15°

7. A, B, and C are three points on a circle such that the angles subtended by the chords AB and AC at the centre O are 90° and 110° respectively. Further suppose that the centre 'O' lies in the interior ∠BAC, then what is the supplementary angle of ∠BAC

   a) 40° b) 80° c) 100° d) 20°

8. If the lengths of the sides AB, BC and CA of a ΔABC are 10cm, 8cm and 6cm respectively. If M is the midpoint of BC and MN ∥ AB to cut AC at N, then the area of the trapezium ABMN is equal to

   a) 18sq.cm b) 20sq.cm c) 12sq.cm d) 16sq.cm

9. ABC is an equilateral triangle. P and Q are two points on AB and AC respectively such that PQ // BC. If PQ = 5 cm the area of Δ APQ is:

   a) $\frac{25}{4}$ sq.cm b) $\frac{25}{\sqrt{3}}$ sq cm c) $\frac{25\sqrt{3}}{4}$ sq cm d) $25\sqrt{3}$ sq cm

10. The external bisector of ∠B and ∠C of ΔABC (where AB and AC extended to E and F respectively) meet at point P. If ∠BAC = 100°, then the measure of ∠BPC is

    a) 50° b) 80° c) 40° d) 100°

11. The lengths of the perpendiculars drawn from any point in the interior of an equilateral triangle to the respective sides are P_1, P_2 and P_3. The length of each side of the triangle is

    a) $\frac{2}{\sqrt{3}}$ $(P_1+ P_2 +P_c)$ b) $\frac{1}{3}$ $(P_1+ P_2 +P_c)$

    c) $\frac{1}{\sqrt{3}}$ $(P_1+ P_2 +P_c)$ d) $\frac{4}{\sqrt{3}}$ $(P_1+ P_2 +P_c)$

12. If the difference between areas of the circumcircle and the incircle of an equilateral triangle is 44cm^2, then the area of the triangle is (Take $\pi = \frac{22}{7}$)

    a) 28cm^2 b) $7\sqrt{3}$cm^2 c) $14\sqrt{3}$cm^2 d) 21cm^2

13. ABC is an equilateral triangle of side 2cm. With A, B, C as centres and radius 1cm three arcs are drawn. The area of the region within the triangle bounded by the three arcs is

a) $(3\sqrt{3} - \frac{\pi}{2})$ cm^2 b) $(\sqrt{3} - \frac{3\pi}{2})$ cm^2

c) $(\sqrt{3} - \frac{\pi}{2})$ cm^2 d) $(\frac{\pi}{2} - \sqrt{3})$ cm^2

14. In an equilateral triangle ABC of side 10cm, the side BC is trisected at D. Then the length (in cm) of AD is

a) $3\sqrt{7}$ b) $7\sqrt{3}$ c) $\frac{10\sqrt{7}}{3}$ d) $\frac{7\sqrt{10}}{3}$

15. ABC is an isosceles triangle with AB = AC. A circle through B touching AC at the middle point intersects AB at P. Then AP:AB is:

a) 4:1 b) 2:3 c) 3:5 d) 1:4

16. In Δ ABC, ∠C is an obtuse angle. The bisectors of the exterior angles at A and B meet BC and AC produced at D and E respectively. If AB = AD = BE, then ∠ACB =

a) 105° b) 108° c) 110° d) 135°

17. D is any point on side AC of Δ ABC. If P, Q, X, Y are the midpoints AB, BC, AD and DC respectively, then the ratio of PX and QY is

a) 1:2 b) 1:1 c) 2:1 d) 2:3

18. If the circumcentre of a triangle lie on the side whose adjacent angles are 45° each, then find the other two sides if the radius of the circumcircle is 15 cm

a) 15 cm b) 30cm c) $15\sqrt{2}$cm d) $30\sqrt{2}$cm

19. ABCD is a cyclic quadrilateral. AB and DC when produced meet at P, if PA = 8cm, PB = 6cm, PC = 4cm, then the length (in cm) of PD is

    a) 10cm b) 12cm c) 6cm d) 8cm

20. From a point within an equilateral triangle perpendiculars, draw to the three side, are 6cm, 7 cm and 8 cm respectively. The length of the side of the triangle is:

    a) 7√3 cm b) 10.5 cm c) 14√3 cm d) 14√3 / 3 cm

Answers

1 – c	2 – d	3 – d	4 – c	5 – d	6 - d	7 - c	8 - a	9 - c	10 - c
11 - a	12 - c	13 - c	14 - c	15 - d	16 - b	17 - b	18 - c	19 - b	20 - c