



MATHS

BOOKS - OBJECTIVE RD SHARMA MATHS VOL I (HINGLISH)

PROPERTIES OF TRIANGLES AND CIRCLES CONNECTED WITH THEM

Illustration

1. In any ΔABC , $\sum a(\sin B - \sin C) =$

A. $2s$

B. $a^2 + b^2 + c^2$

C. 0

D. none of these

Answer:



Watch Video Solution

2. In any ΔABC , $\sum a \sin (B -C) =$

A. $2s$

B. $a+b+c$

C. $a^2 + b^2 + c^2$

D. 0

Answer:



Watch Video Solution

3. In any ΔABC , $\sum a^2(\sin^2 B - \sin^2 C) =$

A. $2s$

B. $a^2 + b^2 + c^2$

C. 0

D. none of these

Answer: C



[Watch Video Solution](#)

4. In any ΔABC , $\sum (b - c) \cot A/2 =$

A. 0

B. 1

C. -1

D. none of these

Answer:



[Watch Video Solution](#)

5. If in a ΔABC ,

$\sin A : \sin C = \sin(A - B) : \sin(B - C)$, then a^2, b^2, c^2 are in

A. A.P

B. G.P.

C. H.P.

D. none of these

Answer: A



[Watch Video Solution](#)

6. In a ΔABC , if $a = 2$, $B = 60^\circ$ and $C = 75^\circ$, then $b =$

A. $\sqrt{3}$

B. $\sqrt{6}$

C. $\sqrt{9}$

D. $1 + \sqrt{2}$

Answer: B



[Watch Video Solution](#)

7. In a $\triangle ABC$, if $A = 45^\circ$ and $C = 60^\circ$, then $a + \sqrt{2}C =$

A. b

B. $2b$

C. $\sqrt{2}b$

D. $\sqrt{3}b$

Answer:



[Watch Video Solution](#)

8. If the angles of a triangle are in the ratio $2 : 3 : 7$, then the sides are in the ratio

A. $\sqrt{2}:2:\sqrt{3}+1$

B. $2:\sqrt{2}:\sqrt{3}:1$

C. $\sqrt{2}:\sqrt{3}+1:2$

D. $2:3:7$

Answer: A



Watch Video Solution

9. If two angles of a $\triangle ABC$ are 45° and 60° , then the ratio of the smallest and greatest sides are

A. $(\sqrt{3}-1):1$

B. $\sqrt{3}:\sqrt{2}$

C. $1:\sqrt{3}$

D. $\sqrt{3}:1$

Answer: A

 [Watch Video Solution](#)

10. In a ΔABC , if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ and the side $a = 2$, then area of the triangle is

- A. 1
- B. 2
- C. $\sqrt{3}/2$
- D. $\sqrt{3}$

Answer: D

 [Watch Video Solution](#)

11. The perimeter of a ΔABC is 6 times the arithmetic mean of the sines of its angles. If the side a is 1, then the angle A is

- A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. π

Answer: A



Watch Video Solution

12. If in a $\triangle ABC$, $c = 3b$ and $C - B = 90^\circ$, then $\tan B =$

A. $2 + \sqrt{3}$

B. $2 - \sqrt{3}$

C. 3

D. $1/3$

Answer: D



Watch Video Solution

13. If the sides of a triangle are in the ratio $1 : \sqrt{3} : 2$, then the angles of the triangle are in the ratio

A. 1 : 3 : 5

B. 2 : 3 : 1

C. 3 : 2 : 1

D. 1 : 2 : 3

Answer: D



[Watch Video Solution](#)

14. In a $\triangle ABC$, if $b + c = 3a$, then the value of $\frac{\cot B}{2} \frac{\cot C}{2}$, is

A. 1

B. 2

C. $\sqrt{3}$

D. 3

Answer: B



[Watch Video Solution](#)

15. The angles of a triangle are in the ratio 3 : 5 : 10, the ratio of the smallest side to the greatest side is

A. $1 : \sin 10^\circ$

B. $1 : 2\sin 10^\circ$

C. $1 : \cos 10^\circ$

D. $1 : 2\cos 10^\circ$

Answer: D



[Watch Video Solution](#)

16. In any $\triangle ABC$, $2(bc \cos A + ca \cos B + ab \cos C) =$

A. $a^2 + b^2 + c^2$

B. abc

C. $a+b+c$

D. none of these

Answer:



Watch Video Solution

17. The sides of a triangle are a, b and $\sqrt{a^2 + b^2 + ab}$ then the greatest angle is

A. 60°

B. 90°

C. 120°

D. none of these

Answer:

 Watch Video Solution

18. In a triangle ABC, $a = 4$, $b = 3$, $\angle A = 60^\circ$. Then, c is the root of the equation

A. $c^2 - 3c - 7 = 0$

B. $c^2 + 3c + 7 = 0$

C. $c^2 - 3c + 7 = 0$

D. $c^2 + 3c - 7 = 0$

Answer:

 Watch Video Solution

19. In a $\triangle ABC$, if $(c+a+b)(a+b-c) = ab$, then the measure of angle C is

A. $\frac{\pi}{3}$

B. $\frac{\pi}{6}$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{2}$

Answer:



Watch Video Solution

20. In a $\triangle ABC$, if the sides a, b, c are the roots of the equation

$x^3 - 11x^2 + 38x - 40 = 0$, then $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} =$

A. $\frac{16}{9}$

B. $\frac{3}{4}$

C. $\frac{4}{3}$

D. $\frac{9}{16}$

Answer:



Watch Video Solution

21. In a $\triangle ABC$,

$$\frac{b^2 - c^2}{a \sec A} + \frac{c^2 - a^2}{b \sec B} + \frac{a^2 - b^2}{c \sec C} =$$

- A. 1
- B. 0
- C. abc
- D. none of these

Answer: B



[Watch Video Solution](#)

22. In a $\triangle ABC$, if $a = 4$, $b = 5$, $c = 6$ then angle C is equal to

- A. A
- B. $\frac{1}{2}A$
- C. $2A$
- D. $3A$

Answer:



Watch Video Solution

23. In a $\triangle ABC$, if $\angle C = 60^\circ$, then

$$\frac{b}{c^2 - a^2} + \frac{a}{c^2 - b^2} =$$

A. $a+b+c$

B. $\frac{1}{a+b+c}$

C. abc

D. 0

Answer:



Watch Video Solution

24. In a triangle ABC, $2ac \sin\left(\frac{A - B + C}{2}\right) =$

A. $a^2 + b^2 - c^2$

B. $c^2 + a^2 - b^2$

C. $b^2 - c^2 - a^2$

D. $c^2 - a^2 - b^2$

Answer:



Watch Video Solution

25. The angles A, B and C of a triangle are in A.P. If AB= 6 units, BC = 7units, then AC is equal to

A. 5 units

B. 7 units

C. 8 units

D. none of these

Answer:

 [Watch Video Solution](#)

26. In a triangle ABC, $a (b \cos C - c \cos B) =$

A. a^2

B. $b^2 - c^2$

C. 0

D. none of these

Answer:

 [Watch Video Solution](#)

27. The straight roads intersect at an angle of 60° . A bus on one road is 2 km away from the intersection and a car on tire other road is 3 km away from the intersection. Then, the direct distance between the two vehicles, is

A. 1 km

B. $\sqrt{2}$ km

C. 4 km

D. $\sqrt{7}$ km

Answer:



[Watch Video Solution](#)

28. In a ΔABC , $b \frac{\cos^2 C}{2} + c \frac{\cos^2 B}{2}$ is equal to

A. s

B. $2s$

C. $s/2$

D. none of these

Answer:



[Watch Video Solution](#)

29. In a ΔABC , $\sum (b + c)\cos A =$

A. $a+b+c$

B. $a+b-c$

C. $a-b+c$

D. none of these

Answer:



[Watch Video Solution](#)

30. In a ΔABC , $a(\cos^2 B + \cos^2 C) + \cos A(c \cos C + b \cos B) =$

A. a

B. b

C. c

D. 0

Answer:



[Watch Video Solution](#)

31. In a ΔABC , if $a \frac{\cos^2 B}{2} + b \frac{\cos^2 A}{2} = \frac{3c}{2}$, then

A. a,b,c are in A.P.

B. a,c,b are in A.P.

C. a,b,c are in G.P.

D. none of these

Answer:



[Watch Video Solution](#)

32. In any ΔABC , $\sum \frac{\cos A}{b \cos C + c \cos B}$ is equal to

A. $a^2 + b^2 + c^2$

B. $\frac{a^2 + b^2 + c^2}{abc}$

C. $\frac{a^2 + b^2 + c^2}{2abc}$

D. none of these

Answer:

 [Watch Video Solution](#)

33. In a $\triangle ABC$, if $a=13, b=14, c=15$, then $\frac{\sin A}{2} =$

A. $\frac{1}{\sqrt{5}}$

B. $\frac{2}{\sqrt{5}}$

C. $\frac{3}{\sqrt{5}}$

D. $\frac{4}{\sqrt{5}}$

Answer:

 [Watch Video Solution](#)

34. If in a ΔABC , $\Delta = (c + a - b)(a + b - c)$, then $\tan A$ is equal to

A. $\frac{2}{\sqrt{3}}$

B. $\frac{8}{15}$

C. $\frac{15}{16}$

D. none of these

Answer: B



[Watch Video Solution](#)

35. In a ΔABC , $2a \frac{\sin^2 C}{2} + 2c \frac{\sin^2 A}{2} =$

A. $2(s-c)$

B. $2(s-b)$

C. $2(s-a)$

D. s

Answer: B



Watch Video Solution

36. In a ΔABC , if $\frac{\tan A}{2} = \frac{5}{6}$ and $\frac{\tan B}{2} = \frac{20}{37}$ then $\frac{\tan C}{2} =$

A. $\frac{4}{5}$

B. $\frac{3}{5}$

C. $\frac{2}{5}$

D. none of these

Answer:



Watch Video Solution

37. In a ΔABC , if $a = 2x$, $b = 2y$ and $\Delta C = 120^\circ$, then area of the triangle is

A. xy

B. $\sqrt{3}xy$

C. $3xy$

D. $2xy$

Answer:



[Watch Video Solution](#)

38. If the area of $\triangle ABC$ be λ , then $a^2 \sin 2B + b^2 \sin 2A$ is equal to,

A. 2λ

B. λ

C. 4λ

D. none of these

Answer:



[Watch Video Solution](#)

39. In $\triangle ABC$, $c^2 = a^2 + b^2$, then $4s(s-a)(s-b)(s-c) =$

A. a^2b^2

B. c^2a^2

C. b^2c^2

D. s^4

Answer:



[Watch Video Solution](#)

40. In a $\triangle ABC$,

$$\frac{(a^2 - b^2)\sin A \sin B}{2\sin(A - B)} =$$

A. 2Δ

B. 4Δ

C. Δ

D. 3Δ

Answer:



[Watch Video Solution](#)

41. In ΔABC , $(a + b + c) \left(\frac{\tan A}{2} + \frac{\tan B}{2} \right) =$

A. $2c \frac{\cot C}{2}$

B. $2a \frac{\cot A}{2}$

C. $2b \frac{\cot B}{2}$

D. $\frac{\tan C}{2}$

Answer:



[Watch Video Solution](#)

42. In a $\triangle ABC$, if $\tan \frac{A}{2} = \frac{5}{6}$ and $\frac{\tan C}{2} = \frac{2}{5}$, then

A. $b^2 = ac$

B. $2b = ac$

C. $2ac = b(a + c)$

D. $a+b+c$

Answer:



[Watch Video Solution](#)

43. In a $\triangle ABC$, $2A(\cot B + \cot C) =$

A. b^2

B. c^2

C. a^2

D. $2a^2$

Answer:



[Watch Video Solution](#)

44. In a ΔABC ,

$$(c^2 + a^2 - b^2)\tan B + (a^2 + b^2 - c^2)\tan C =$$

A. 4Δ

B. 8Δ

C. 6Δ

D. 12Δ

Answer:



[Watch Video Solution](#)

45. In ΔABC , $4\Delta(\cot A + \cot B + \cot C) =$

A. $a+b+c$

B. $a^{-1} + b^{-1} + c^{-1}$

C. $a^2 + b^2 + c^2$

D. none of these

Answer:

 [Watch Video Solution](#)

46. In any $\triangle ABC$, $a \cos A + b \cos B + c \cos C =$

A. $\frac{\Delta^2}{abc}$

B. $\frac{4\Delta^2}{abc}$

C. $\frac{8\Delta^2}{abc}$

D. none of these

Answer:

 [Watch Video Solution](#)

47. A triangular park is enclosed on two sides of a fence and on the third side by a straight river bank. The two sides having fence are of same length x . The maximum area enclosed by the park is

A. $\frac{3}{2}x^2$

B. $\sqrt{\frac{x^3}{8}}$

C. $\frac{1}{2}x^2$

D. πx^2

Answer:



[Watch Video Solution](#)

48. In any $\triangle ABC$, $\sin A + \sin B + \sin C =$

A. $\frac{2s}{R}$

B. $\frac{s}{R}$

C. $\frac{3s}{R}$

D. none of these

Answer:



[Watch Video Solution](#)

49. In a ΔABC

$$\frac{b \sin(C - A)}{c^2 - a^2} + \frac{c \sin(A - B)}{a^2 - b^2} =$$

A. $\frac{1}{2R}$

B. $\frac{1}{R}$

C. $\frac{2}{R}$

D. none of these

Answer:



[Watch Video Solution](#)

50. If the radius of the circumcircle of an isosceles triangle PQR is equal to PQ (= PR), then the angle P, is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{2\pi}{3}$

D.

Answer:



[Watch Video Solution](#)

51. In a ΔABC , $R^2 (\sin 2A + \sin 2B + \sin 2C) =$

A. Δ

B. 3Δ

C. 4Δ

D. 2Δ

Answer:



[Watch Video Solution](#)

52. The diameter of the circumcircle of a triangle with sides 5 cm, 6 cm and 7 cm, is

A. $\frac{3\sqrt{6}}{2}$ cm

B. $2\sqrt{6}$ cm

C. $\frac{35}{48}$ cm

D. none of these

Answer:



[Watch Video Solution](#)

53. If Δ denotes the area of ΔABC , then $b^2 \sin 2C + c^2 \sin 2B$ is equal to

A. Δ

B. 2Δ

C. 3Δ

D. 4Δ

Answer:



[Watch Video Solution](#)

54. If R denotes the circum-radius of a ΔABC , then $\frac{b^2 - c^2}{2aR}$ is equal to

A. $\cos (B-C)$

B. $\cos B - \cos C$

C. $\sin (B - C)$

D. none of these

Answer:



[Watch Video Solution](#)

55. If in $\triangle ABC$, $b^2 \sin 2C + c^2 \sin 2B = 2bc$, then the triangle is

- A. equilateral
- B. isosceles with $\angle B = \angle C$
- C. right angled at A
- D. none of these

Answer:



[Watch Video Solution](#)

56. If a $\triangle ABC$ is right angled at B, then the diameter of the incircle of the triangle is

- A. $2(c + a - b)$
- B. $c + a - 2b$
- C. $c + a - b$

D. none of these

Answer:



[Watch Video Solution](#)

57. In a triangle $a = 13$, $b = 14$, $c = 15$, $r =$

A. 4

B. 8

C. 2

D. 6

Answer:



[Watch Video Solution](#)

58. In an equilateral triangle the in-radius and the circum-radius are connected by

A. $r=4R$

B. $r = \frac{R}{2}$

C. $r = \frac{R}{3}$

D. none of these

Answer:



[Watch Video Solution](#)

59. In an equilateral triangle, the in-radius, circum-radius and one of the ex-radii are in the ratio

A. 2 : 3 : 5

B. 1 : 2 : 3

C. 1 : 3 : 7

D. 3 : 7 : 9

Answer:



[Watch Video Solution](#)

60. If in a triangle $\left(1 - \frac{r_1}{r_2}\right)\left(1 - \frac{r_1}{r_3}\right) = 2$, then the triangle is

- A. right angled
- B. isosceles
- C. equilateral
- D. none of these

Answer:



[Watch Video Solution](#)

61. If $\frac{r}{r_1} = \frac{r_2}{r_3}$, then

A. $A = 90^\circ$

B. $B = 90^\circ$

C. $C = 90^\circ$

D. none of these

Answer:



Watch Video Solution

62. In a triangle ABC, $r_1 + r = r_2 + r_3$. If the measure of angle A is 60° ,

then $\frac{s}{a} =$

A. $\frac{2}{3}$

B. 2

C. $\frac{4}{3}$

D. $\frac{3}{2}$

Answer:

 Watch Video Solution

63. In a triangle with sides a, b, c if $r_1 > r_2 > r_3$ (which are the ex-radii), then

A. $a > b > c$

B. $a < b < c$

C. $a > b$ and $b < c$

D. $a < b$ and $b > c$

Answer:

 Watch Video Solution

64. If $\triangle ABC$ is right angled at A, then $r_2 + r_3 =$

A. $r_1 - r$

B. $r_1 + r$

C. $r - r_1$

D. R

Answer:



[Watch Video Solution](#)

65. $r + r_3 + r_1 - r_2 =$

A. $4R \cos A$

B. $4R \cos B$

C. $4R \cos C$

D. $4R$

Answer:



[Watch Video Solution](#)

66. In a ΔABC , $r_1 + r_2 + r_3 - r =$

A. $4R \cos A$

B. $4R \cos B$

C. $4R \cos C$

D. $4R$

Answer:



[Watch Video Solution](#)

67. In a ΔABC , with usual notations, observe the two statements given

below:

$$(I) r r_1 r_2 r_3 = \Delta^2 \quad (II) r_1 r_2 + r_2 r_3 + r_3 r_1 = s^2$$

Which one of the following is correct?

A. both I and II are true

B. I is true, II is false

C. I is false, II is true

D. both I and II are false

Answer:



[Watch Video Solution](#)

68. The value of $\frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} + \frac{1}{r^2}$, is

A. 0

B. $\frac{a^2 + b^2 + c^2}{\Delta^2}$

C. $\frac{\Delta^2}{a^2 + b^2 + c^2}$

D. $\frac{a^2 + b^2 + c^2}{\Delta^2}$

Answer:



[Watch Video Solution](#)

1. In a $\triangle ABC$, $\frac{a+c}{a-c} \frac{\tan B}{2}$ is equal to

A. $\tan\left(\frac{B}{2} + C\right)$

B. $\tan\left(B + \frac{C}{2}\right)$

C. $\cot\left(\frac{B}{2} + C\right)$

D. none of these

Answer:



Watch Video Solution

2. In a $\triangle ABC$, which one of the following is true?

A. $(b+c) \frac{\cos A}{2} = a \sin\left(\frac{B+C}{2}\right)$

B. $(b+c) \cos\left(\frac{B+C}{2}\right) = a \frac{\sin A}{2}$

C. $(b-c) \cos\left(\frac{B-C}{2}\right) = a \frac{\cos A}{2}$

$$D. (b - c) \frac{\cos A}{2} = a \sin\left(\frac{B - C}{2}\right)$$

Answer:

 [Watch Video Solution](#)

3. In a $\triangle ABC$, $a \frac{\cos^2 B}{2} + b \frac{\cos^2 A}{2}$ is equal to

A. s

B. $2s$

C. $s/2$

D. none of these

Answer:

 [Watch Video Solution](#)

4. Given an isosceles triangle, whose one angle is $2\frac{\pi}{3}$ and the radius of its incircle $=\sqrt{3}$ Then find the area of the triangle

A. $7 + 12\sqrt{3}$

B. $12 - 7\sqrt{3}$

C. $12 + 7\sqrt{3}$

D. 4π

Answer:



[Watch Video Solution](#)

5. Internal bisector of $\angle A$ of triangle ABC meets side BC at D . A line drawn through D perpendicular to AD intersects the side AC at E and the side AB at F . If a, b, c represent sides of $\triangle ABC$, then

A. AE is HM of b and c

B. $AD = \frac{2bc}{b+c} \frac{\cos A}{2}$

$$C. EF = \frac{4b}{b+c} \frac{\sin A}{2}$$

D. All of these

Answer:



[Watch Video Solution](#)

6. In a triangle ABC with fixed base BC, the vertex A moves such that

$$\cos B + \cos C = 4 \sin^2 \left(\frac{A}{2} \right).$$

If a,b,c denote the lengths of the triangle opposite to the angles A, B and C respectively, then

A. $b+c=4a$

B. $b+c=2a$

C. locus of point A is an ellipse

D. locus of point A is a pair of straight lines

Answer: C





Watch Video Solution

7. In a $\triangle ABC$, if $\frac{\tan A}{2} = \frac{5}{6}$, and $\frac{\tan B}{2} = \frac{20}{37}$, then

A. $2a=b+c$

B. $a > b > c$

C. $2c=a+b$

D. none of these

Answer:



Watch Video Solution

8. In $\triangle ABC$, if $A:B:C = 3:5:4$, then $a + b + \sqrt{2}c =$

A. $2b$

B. $2c$

C. $3b$

D. 3a

Answer:



[Watch Video Solution](#)

9. If the lengths of the sides of a triangle are $a - b$, $a + b$ and $\sqrt{3a^2 + b^2}$, ($a, b > 0$), then the largest angle of the triangle, is

A. $\frac{2\pi}{3}$

B. $\frac{3\pi}{4}$

C. $\frac{\pi}{2}$

D. $\frac{7\pi}{8}$

Answer:



[Watch Video Solution](#)

10. If the angles of the triangle are in A.P. and $3a^2 = 2b^2$, then angle C, is

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{4}$

D. $\frac{5\pi}{12}$

Answer:



[Watch Video Solution](#)

11. In a $\triangle ABC$, $a = 5$, $b = 4$, and $\frac{\tan C}{2} = \sqrt{\frac{7}{9}}$, then $c =$

A. 6

B. 3

C. 2

D. none of these

Answer:



[Watch Video Solution](#)

12. If in a $\triangle ABC$ $\sin A = \frac{4}{5}$ and $\sin B = \frac{12}{13}$, then $\sin C =$

A. $\frac{33}{65}$

B. $\frac{56}{65}$

C. $\frac{33}{56}$

D. none of these

Answer:



[Watch Video Solution](#)

13. If in a $\triangle ABC$, $a = 6$, $b = 3$ and $\cos(A - B) = \frac{4}{5}$, then its area in square units, is

A. 8

B. 9

C. 6

D. none of these

Answer:



[Watch Video Solution](#)

14. The perimeter of a $\triangle ABC$ is 6 times arithmetic mean of the sines of its angles. If $a = 1$, then $A =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. π

Answer:

 [Watch Video Solution](#)

15. If in a $\triangle ABC$, $a = 2b$, and $|A - B| = \frac{\pi}{3}$ then $C =$

A. $\frac{\pi}{4}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{6}$

D. none of these

Answer:

 [Watch Video Solution](#)

16. If in a $\triangle ABC$, $\sin A$, $\sin B$ and $\sin C$ are in A.P, then

A. the altitudes are in A.P.

B. the altitudes are in H.P.

C. the medians are in G.P.

D. the medians are in A.P.

Answer:



[Watch Video Solution](#)

17. If in a $\triangle ABC$, the altitudes from the vertices A, B, C on the opposite sides are in H.P., then $\sin A, \sin B, \sin C$ are in

A. H.P.

B. A.G.P

C. A.P.

D. G.P.

Answer:



[Watch Video Solution](#)

18. In a triangle ABC $\cos A = \frac{7}{8}$, $\cos B = \frac{11}{16}$. then, $\cos C$ is equal to

A. $-\frac{1}{4}$

B. $-\frac{1}{2}$

C. 0

D. $\frac{1}{4}$

Answer:



[Watch Video Solution](#)

19. If the angles A , B , C are the solutions of the equations

$\tan^3 x - 3k \tan^2 x - 3 \tan x + k = 0$, then the triangle ABC is

A. isosceles

B. equilateral

C. acute angled

D. none of these

Answer:



[Watch Video Solution](#)

20. If the angles of the triangle are in the ratio 4 : 1 : 1 , then the ratio of the longest side to the perimeter is

A. $\sqrt{3} : 2 + \sqrt{3}$

B. 1 : 6

C. $1 : 2 + \sqrt{3}$

D. 2 : 3

Answer:



[Watch Video Solution](#)

21. In a triangle ABC , let $\angle C = \frac{\pi}{2}$. If r is the in-radius and R is the circum-radius of the triangle , then $2(r + R)$ is equal to

A. $a+b$

B. $b+c$

C. $c+a$

D. $a+b+c$

Answer:



Watch Video Solution

22. Let PQ and RS be tangents at the extremities of the diameter PR of a circle of radius r . If PS and RQ intersect at a point X on the circumference of the circle, then $2r$ equals

A. $\sqrt{PQ \cdot RS}$

B. $\frac{PQ + RS}{2}$

C. $\frac{2PQ \cdot RS}{PQ + RS}$

D. $\sqrt{\frac{PQ^2 + RS^2}{2}}$

Answer:



Watch Video Solution

23. If a , b , c denote the sides of a $\triangle ABC$ such that the equation $x^2 + \sqrt{2}x + 1 = 0$ and $ax^2 + bx + c = 0$ have a common root , then $C =$

A. $\frac{\pi}{4}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. none of these

Answer:



Watch Video Solution

24. If in a $\triangle ABC$, $b = 12$ units , $c = 5$ units and $\triangle = 30$ sq. units , then the distance between vertex A and incentre of the triangle is equal to

A. 2 units

B. $2\sqrt{2}$ units

C. $\sqrt{2}$ units

D. none of these

Answer:



Watch Video Solution

25. In a $\triangle ABC$, $2r = r_1$ and $A=30^\circ$, then $\cos \frac{B - C}{2}$ is equal to

A. $\frac{3\sqrt{3}}{2\sqrt{2}}$

B. $\frac{3(\sqrt{3} - 1)}{2\sqrt{2}}$

C. $\frac{3(\sqrt{3} - 1)}{2\sqrt{3}}$

D. none of these

Answer:





Watch Video Solution

26. If in a $\triangle ABC$, $a^2 \cos^2 A = b^2 + c^2$, then

A. $0 < A < \frac{\pi}{4}$

B. $\frac{\pi}{4} < A < \frac{\pi}{2}$

C. $\frac{\pi}{2} < A < \pi$

D. $A = \frac{\pi}{2}$

Answer:



Watch Video Solution

27. In a triangle ABC , the sides a, b, c are in G.P., then the maximum value of $\angle B$ is

A. 30°

B. 45°

C. 60°

D. 90°

Answer:



[Watch Video Solution](#)

28. The area of a triangle is $\sqrt{3}$ sq. units and $\angle B$ If a^2, b^2, c^2 are in A.P., the length of side AC is

A. $2\sqrt{3}$ units

B. 2 units

C. 3 units

D. $3\sqrt{3}$ units

Answer:



[Watch Video Solution](#)

29. If in a $\triangle ABC$, $\tan \frac{A}{2}$ and $\tan \frac{B}{2}$ are the roots of the equation $6x^2 - 5x + 1 = 0$, then

A. $a^2 + b^2 > c^2$

B. $a^2 - b^2 = c^2$

C. $a^2 + b^2 = c^2$

D. none of these

Answer:



[Watch Video Solution](#)

30. In a $\triangle ABC$ the length of the median AD to the side BC is 4 units. If $\angle A = 60^\circ$ and the area of the triangle is $2\sqrt{3}$ sq. units. The length of side BC, is

A. $2\sqrt{3}$

B. $4\sqrt{3}$

C. 6

D. 8

Answer:



[Watch Video Solution](#)

31. Two sides of a triangle are given by the roots of the equation $x^2 - 2\sqrt{3}x + 2 = 0$. The angle between the sides is $\pi/3$. The perimeter of the triangle is

A. $6 + \sqrt{3}$

B. $2\sqrt{3} + \sqrt{6}$

C. $2\sqrt{3} + \sqrt{10}$

D. none of these

Answer:



[Watch Video Solution](#)

32. If in $\triangle ABC$, $\frac{c+a}{b} + \frac{c+b}{a} = \frac{c}{r}$ then

A. $\angle B = \frac{\pi}{2}$

B. $\angle C = \frac{\pi}{2}$

C. $\angle A = \frac{\pi}{2}$

D. none of these

Answer:



[Watch Video Solution](#)

33. In a $\triangle ABC$, there is a point D on the side BC such that $\frac{BD}{DC} = \frac{1}{3}$. If $\angle B = \frac{\pi}{3}$, $\angle C = \frac{\pi}{4}$ and $\sin \angle(CAD) = \lambda \sin \angle(BAD)$ then λ is equal to

A. $\frac{1}{\sqrt{6}}$

B. $\sqrt{6}$

C. $\frac{1}{\sqrt{3}}$

D. $\sqrt{3}$

Answer:



Watch Video Solution

34. If G is the centroid of a ΔABC , then $GA^2 + GB^2 + GC^2$ is equal to

A. $a^2 + b^2 + c^2$

B. $\frac{a^2 + b^2 + c^2}{3}$

C. $\frac{a^2 + b^2 + c^2}{2}$

D. $\frac{(a + b + c)^2}{3}$

Answer:



Watch Video Solution

35. In an equilateral triangle the ratio of circum-radius and in-radius is

A. 3 : 1

B. 1 : 1

C. 2 : $\sqrt{3}$

D. 2 : 1

Answer:



[Watch Video Solution](#)

36. In an equilateral triangle circum-radius : In-radius : Ex-radii is equal to

A. 1 : 1 : 1

B. 1 : 2 : 3

C. 2 : 1 : 3

D. 3 : 2 : 4

Answer:



[Watch Video Solution](#)

37. In a scalene triangle ABC , AD and CF are the altitudes drawn from A and C on the sides BC and AB respectively. If the area of the triangle ABC and BDF are 18sq. units and 2 sq. units respectively and $DF = 2\sqrt{2}$, then $R =$

A. $\frac{9}{4}$

B. $\frac{9}{2}$

C. 9

D. none of these

Answer:



[Watch Video Solution](#)

38. The sides of a $\triangle ABC$ are in A.P. such that a lt minimum (b,c) . Then, $\cos A$

may be equal to

A. $\frac{3c - 4b}{2b}$

B. $\frac{3c - 4b}{2c}$

C. $\frac{4c - 3b}{2b}$

D. $\frac{4c - 3b}{2c}$

Answer:



Watch Video Solution

39. If a right angled triangle ABC of maximum Δ area is inscribed in a circle of radius R , then

A. $\Delta = 2R^2$

B. $r = (\sqrt{2} - 1)R$

C. $\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} = \frac{\sqrt{2} - 1}{R}$

D. $s = (\sqrt{2} - 1)R$

Answer:



Watch Video Solution

40. In $\triangle ABC$, $\angle A = \frac{\pi}{2}$, $b = 4$, $c = 3$, then the value of $\frac{R}{r}$ is equal to

A. $\frac{5}{2}$

B. $\frac{7}{2}$

C. $\frac{9}{2}$

D. $\frac{35}{24}$

Answer:

 [Watch Video Solution](#)

41. If in a $\triangle ABC$, CD is the bisector of $\angle ACB$, then $CD =$

A. $\frac{a+b}{2ab} \frac{\cos C}{2}$

B. $\frac{a+b}{ab} \frac{\cos C}{2}$

C. $\frac{2ab}{a+b} \frac{\cos C}{2}$

D. $\frac{b \sin A}{\sin\left(B + \frac{C}{2}\right)}$

Answer:

 [Watch Video Solution](#)

42. Let ABC be a triangle and O be its orthocentre .If R and R_1 are the circum-radii of triangle ABC and AOB , then

A. $R_1 > R$

B. $R_1 = R$

C. $R_1 < R$

D. none of these

Answer: B

 [Watch Video Solution](#)

43. If the area(!) and an angle(θ) of a triangle are given , when the side opposite to the given angle is minimum , then the length of the remaining two sides are

A. $\sqrt{\frac{2!}{\sin \theta}}, \sqrt{\frac{3!}{\sin \theta}}$

B. $\sqrt{\frac{2!}{\sin \theta}}, \sqrt{\frac{2!}{\sin \theta}}$

C. $\sqrt{\frac{4!}{\sin \theta}}, \sqrt{\frac{4!}{\sin \theta}}$

D. $\sqrt{\frac{6!}{\sin \theta}}, \sqrt{\frac{6!}{\sin \theta}}$

Answer:



[Watch Video Solution](#)

44. If the sides of a triangle are in A.P. and the greatest angle of the triangle exceeds the least by 90° , then sine of the third angle is

A. $\frac{\sqrt{5}}{4}$

B. $\frac{\sqrt{6}}{4}$

C. $\frac{\sqrt{7}}{4}$

D. none of these

Answer:



[Watch Video Solution](#)

45. In the $\triangle ABC$, the altitudes are in H.P., then

A. angles A,B,C are in A.P.

B. sides a,b,c are in A.P.

C. $\sin A, \sin B, \sin C$ are in A.P.

D. none of these

Answer:



[Watch Video Solution](#)

46. In a ΔABC , $\angle B = \frac{2\pi}{3}$ and $\cos A + \cos C = \lambda$. Then, the exhaustive set of value of λ is

A. $(1, 3/2]$

B. $(3/2, \sqrt{3})$

C. $(1/2, \sqrt{3}/2)$

D. none of these

Answer:



[Watch Video Solution](#)

47. In ΔABC , least value of $\frac{e^A}{A} + \frac{e^B}{B} + \frac{e^C}{C}$ is equal to

A. $\frac{9}{\pi}e^{\pi/3}$

B. $\frac{\pi}{3}e^{\pi/3}$

C. $\frac{\pi}{9}e^{\pi/3}$

D. none of these

Answer:



[Watch Video Solution](#)

48. If circum-radius and in-radius of a triangle ABC be 10 and 3 units respectively, then $\cot A + \cot B + \cot C$ is equal to

A. 13

B. 26

C. 39

D. none of these

Answer:



[Watch Video Solution](#)

49. In $\triangle ABC$, x , y , and z are the distance of incentre from angular points A, B, and C respectively. If $\frac{xyz}{abc} = \frac{\lambda r}{s}$, then $\lambda =$

- A. 1
- B. 2
- C. 3
- D. none of these

Answer: A



[Watch Video Solution](#)

50. If Δ denote the area of any triangle with semi-perimeter s , then

- A. $\Delta < \frac{s^2}{2}$
- B. $\Delta > \frac{s^2}{4}$
- C. $\Delta < \frac{s^2}{4}$
- D. $\Delta < s^2$

Answer:



[Watch Video Solution](#)

51. In any $\triangle ABC$, $\sin \frac{A}{2}$ is

A. less than $\frac{b+c}{a}$

B. less than or equal to $\frac{a}{b+c}$

C. greater than $\frac{2a}{a+b+c}$

D. none of these

Answer:



[Watch Video Solution](#)

52. In a $\triangle ABC$, $AB = 2$, $BC = 4$, $CA = 3$. If D is the mid-point of BC, then the correct statement(s) is/are

A. $\cos B \neq \frac{11}{16}$

B. $\cos C \neq \frac{7}{8}$

C. $AD \neq 2.4$

D. $AD^2 = 2.5$

Answer:

 [Watch Video Solution](#)

53. If in a $\triangle ABC$, $a^2 + b^2 + c^2 = ac + \sqrt{3}ab$ then the triangle is

A. equilateral

B. right angled and isosceles

C. right angled and not isosceles

D. none of these

Answer:

 [Watch Video Solution](#)

54. In a $\triangle ABC$ bisector of angle C meets the side AB at D and circumcircle at E. The maximum value of $CD \cdot DE$ is equal to

A. $\frac{b^2}{4}$

B. $\frac{c^2}{4}$

C. $\frac{a^2}{4}$

D. none of these

Answer:



[Watch Video Solution](#)

55. In triangle ABC , AD and BE are the medians drawn through the angular points A and B respectively. $\angle DAB = 2\angle ABE = 36^\circ$ and $AD = 6$ units then circumradius of the triangle is equal to

A. $(3 - \sqrt{5}) \operatorname{cosec} C$

B. $(3 + \sqrt{5}) \cos ecC$

C. $2(3 - \sqrt{5}) \cos ecC$

D. $2(3 + \sqrt{5}) \operatorname{cosec}C$

Answer:



Watch Video Solution

56. If the median AM , angle bisector AD and altitude AH drawn from vertex A of a triangle ABC divide angle A into four equal (D lying between H and M), then

A. $A = \frac{\pi}{3}$

B. $A = \frac{\pi}{2}$

C. $\frac{AC}{AB} = \sqrt{2} + 1$

D. $\frac{AC}{AB} = \frac{1}{\sqrt{2} + 1}$

Answer:

[Watch Video Solution](#)

57. Which of the following pieces of data does not uniquely determine an acute-angled triangle ABC (R being the radius of the circumcircle)?

A. $a, \sin A, \sin B$

B. a, b, c

C. $a, \sin B, R$

D. $a, \sin A, R$

Answer:

[Watch Video Solution](#)

58. If a chord AB of a circle subtends an angle θ ($\neq \pi/3$) at a point C on the circumference such that the triangle ABC has maximum area, then

A. $A = \frac{\pi}{3} + \frac{\theta}{2}, B = \frac{2\pi}{3} - \frac{3\theta}{2}$

B. $A = \frac{\pi}{4} + \frac{\theta}{2}, B = \frac{3\pi}{4} - \frac{3\theta}{2}$

C. $A = \frac{\pi}{6} + \theta, B = \frac{5\pi}{6} + 2\theta$

D. none of these

Answer:



[Watch Video Solution](#)

59. In a $\triangle ABC$, medians AD and BE are drawn. If $AD = 4$, $\angle DAB = \pi/6$ and $\angle ABE = \pi/3$ then the area of $\triangle ABC$ is

A. $\frac{64}{3\sqrt{3}}$

B. $\frac{8}{3\sqrt{3}}$

C. $\frac{16}{3\sqrt{3}}$

D. $\frac{32}{3\sqrt{3}}$

Answer:



[Watch Video Solution](#)

60. In a $\triangle ABC$ if $\sin A \cos B = \frac{1}{4}$ and $3 \tan A = B$, then the triangle is

- A. right angled at A
- B. right angled at B
- C. right angled at C
- D. not right angled

Answer:



[Watch Video Solution](#)

61. In a $\triangle ABC$ if $r_1 = 36$, $r_2 = 18$ and $r_3 = 12$, then the area of the triangle, in square units, is

- A. 216
- B. 316
- C. 326

D. none of these

Answer:



[Watch Video Solution](#)

62. In a $\triangle ABC$ if $r_1 = 36$, $r_2 = 18$ and $r_3 = 12$, then the perimeter of the triangle, is

A. 36

B. 18

C. 72

D. none of these

Answer:



[Watch Video Solution](#)

63. If in a $\triangle ABC$, AD , BE and CF are the altitudes and R is the circumradius, then find the radius of the $\triangle DEF$.

A. $\frac{R}{2}$

B. $2R$

C. R

D. none of these

Answer:



[Watch Video Solution](#)

64. In a $\triangle ABC$ if $a = 7$, $b = 8$ and $c = 9$, then the length of the line joining B to the mid-points of AC is

A. 6

B. 7

C. 5

D. none of these

Answer:



[Watch Video Solution](#)

65. If the perimeter of a triangle and the diameter of an ex-circle are equal, then the triangle is

A. right angled isosceles

B. right angled

C. equilateral

D. isosceles

Answer:



[Watch Video Solution](#)

66. If D is the mid-point of the side BC of a triangle ABC and AD is perpendicular to AC, then

A. $b^2 = a^2 - c^2$

B. $a^2 + b^2 = 5c^2$

C. $3b^2 = a^2 - c^2$

D. $3a^2 = b^2 - 3c^2$

Answer:



[Watch Video Solution](#)

67. ABC is a triangle. D is the middle point of BC. If AD is perpendicular to AC, The value of $\cos A \cos C$, is

A. $\left(3 \frac{c^2 - a^2}{ac}\right)$

B. $\frac{a^2 - c^2}{2ac}$

C. $\left(2 \frac{c^2 - a^2}{3ac}\right)$

D. none of these

Answer:



[Watch Video Solution](#)

68. If the median of a triangle through A is perpendicular to AB, then

A. $2\tan A + \tan B = 0$

B. $2\tan A - \tan B = 0$

C. $\tan A - 2\tan B = 0$

D. $\tan A + 2\tan B = 0$

Answer:



[Watch Video Solution](#)

69. In a $\triangle ABC$, if $r_1 = 2r_2 = 3r_3$, then $a:b:c =$

A. 3:4:5

B. 5:3:4

C. 5:4:3

D. none of these

Answer:



[Watch Video Solution](#)

70. In a $\triangle ABC$ if $r_1 < r_2 < r_3$, then

A. $a > b > c$

B. $a < b < c$

C. $a < c < b$

D. none of these

Answer:



[Watch Video Solution](#)

71. In a $\triangle ABC$ if $r_1 = 8$, $r_2 = 12$ and $r_3 = 24$, then $a =$

A. 16

B. 20

C. 12

D. none of these

Answer:



[Watch Video Solution](#)

72. If I is the incentre of a $\triangle ABC$ such that $\angle A = 60^\circ$, then $AI =$

A. r

B. $\frac{r}{2}$

C. $2r$

D. none of these

Answer: C



[Watch Video Solution](#)

73. If I_1 is the centre of the escribed circle touching side BC of $\triangle ABC$ in which $\angle A = 60^\circ$, then $I_1 A =$

A. r_1

B. $\frac{r_1}{2}$

C. $2r_1$

D. none of these

Answer: C



[Watch Video Solution](#)

74. In a $\triangle ABC$, if $2R + r = r_1$, then

A. $\angle A = \pi/2$

B. $\angle B = \pi/2$

C. $\angle C = \pi/2$

D. none of these

Answer:



[Watch Video Solution](#)

75. The sides of the triangle are $\sin \alpha$, $\cos \alpha$ and $\sqrt{1 + \sin \alpha \cos \alpha}$ for some $0 < \alpha < \frac{\pi}{2}$. Then the greatest angle of the triangle is

A. 150°

B. 90°

C. 120°

D. 60°

Answer:



[Watch Video Solution](#)

76. In a $\triangle ABC$, if $3a = b + c$, then $\cot \frac{B}{2} \cot \frac{C}{2} =$

A. 1

B. 2

C. 3

D. 4

Answer:



[Watch Video Solution](#)

77. In $\triangle ABC$, if $\frac{\sin^2 A}{2}, \frac{\sin^2 B}{2}, \frac{\sin^2 C}{2}$ be in H.P., then a, b, c will be in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer:



[Watch Video Solution](#)

78. In a $\triangle ABC$, if $\frac{1}{b+c} + \frac{1}{c+a} = \frac{3}{a+b+c}$, then $\angle C =$

A. 90°

B. 60°

C. 45°

D. 30°

Answer:



[Watch Video Solution](#)

79. Observe the following statements: (I) In

$$\triangle ABC, b \frac{\cos^2 C}{2} + \cos^2 \frac{B}{2} = s \quad , \quad (II) \quad \text{In}$$

$$\triangle ABC \frac{\cot A}{2} = \frac{b+c}{2} \Rightarrow B = 90^\circ$$

Which of the following is correct?

- A. both I and II are true
- B. I is true, II is false
- C. I is false, II is true
- D. both I and II are false

Answer:

 [Watch Video Solution](#)

80. In a triangle, if $r_1 = 2r_2 = 3r_3$, then $\frac{a}{b} + \frac{b}{c} + \frac{c}{a}$ is equal to

- A. $\frac{75}{60}$
- B. $\frac{155}{60}$

C. $\frac{176}{60}$

D. $\frac{191}{60}$

Answer:



[Watch Video Solution](#)

81. Sides a , b , c of $\triangle ABC$ are in A.P. and

$\cos \theta_1 = \frac{a}{b+c} \cos \theta_2 = \frac{b}{a+c}$, $\cos \theta_3 = \frac{c}{a+b}$, then

$$\frac{\tan^2(\theta_1)}{2} + \frac{\tan^2(\theta_3)}{2} =$$

A. $2/3$

B. 1

C. $\sqrt{5}/3$

D. none of these

Answer:



[Watch Video Solution](#)

82. Consider a triangle ABC and let a , b , and c denote the lengths of the sides opposite to vertices A, B and C respectively. suppose $a = 6$, $b = 10$ and the area of the triangle is $15\sqrt{3}$. If $\angle ACB$ is obtuse and if r denotes the radius of the in circle of the triangle, then r^2 is equal to

- A. 2
- B. 4
- C. 3
- D. 6

Answer:



[Watch Video Solution](#)

83. If the angle A, B and C of a triangle are in arithmetic progression and if a , b and c denote the lengths of the sides to A, B and C respectively, then the value of the expression $\frac{a}{b} \sin 2C + \frac{c}{a} \sin 2A$ is

A. $\frac{1}{2}$

B. $\frac{\sqrt{3}}{2}$

C. 1

D. $\sqrt{3}$

Answer:



Watch Video Solution

84. Let ABC be a triangle such that $\angle ACB = \frac{\pi}{6}$ and let a , b and c denote the lengths of the side opposite to A ,B and C respectively. The value of x for which $a = x^2 + x + 1$, $b = x^2 - 1$ and $c = 2x + 1$ is

A. $-(2 + \sqrt{3})$

B. $1 + \sqrt{3}$

C. $2 + \sqrt{3}$

D. $4\sqrt{3}$

Answer:



Watch Video Solution

85. For a regular polygon , let r and R be the radii of the inscribed and circumscribed circles. A false statement among the following is

A. There is a regular polygon with $\frac{r}{R} = \frac{2}{3}$

B. There is a regular polygon with $\frac{r}{R} = \frac{\sqrt{3}}{2}$

C. There is a regular polygon with $\frac{r}{R} = \frac{1}{2}$

D. There is a regular polygon with $\frac{r}{R} = \frac{1}{\sqrt{2}}$

Answer:



Watch Video Solution

86. Let PQR be a triangle of ! area with $a = 2$, $b = \frac{7}{2}$ and $c = \frac{5}{2}$, where a , b and c are the lengths of the sides of the triangle opposite to the angles P

, Q and R respectively. Then , $\frac{2 \sin P - \sin 2P}{2 \sin P + \sin P}$ equals

A. $\frac{3}{4!}$

B. $\frac{45}{4!}$

C. $\left(\frac{3}{4!}\right)^2$

D. $\left(\frac{45}{4!}\right)^2$

Answer:



[Watch Video Solution](#)

87. ABCD is a trapezium such that AB and CD are parallel and $BC \perp CD$.

if $\angle ADB = \theta$, $BC=p$ and $CD=q$, then AB is equal to

A. $\frac{(p^2 + q^2) \sin \theta}{p \cos \theta + q \sin \theta}$

B. $\frac{p^2 + q^2 \cos \theta}{p \cos \theta + q \sin \theta}$

C. $\frac{p^2 + q^2}{p^2 \cos \theta + q^2 \sin \theta}$

D. $\frac{(p^2 + q^2) \sin \theta}{(p \cos \theta + q \sin \theta)^2}$

Answer:



[Watch Video Solution](#)

88. In a triangle PQR, P is the largest angle and $\cos P = \frac{1}{3}$. Further the triangle touches the side PQ, QR and RP at N, L and M respectively, such that the lengths of PN, QL, and RM are consecutive even integers. Then possible length(s) of the side(s) of the triangle is(are)

A. 16,18

B. 18,22

C. 22,24

D. 16,20

Answer:



[Watch Video Solution](#)

89. In a triangle the sum of two sides is x and the product of the same two sides is y . If $x^2 - c^2 = y$, where c is the third side of the triangle, then the ratio of the in-radius to the circum-radius of the triangle is

A. $\frac{3y}{2x(x+c)}$

B. $\frac{3y}{2c(x+c)}$

C. $\frac{3y}{4x(x+c)}$

D. $\frac{3y}{4c(x+c)}$

Answer:



Watch Video Solution

90. In $\triangle ABC$, if $\frac{\sin A}{c \sin B} + \frac{\sin B}{c} + \sin C \frac{1}{b} = \frac{c}{ab} + \frac{b}{ac} + \frac{a}{bc}$ then the value of A , is

A. 120°

B. 90°

C. 60°

D. 30°

Answer:

 [Watch Video Solution](#)

91. In $\triangle ABC$, if $2b = a + c$ and $A - C = 90^\circ$, then $\sin B$ equals

A. $\frac{\sqrt{7}}{5}$

B. $\frac{\sqrt{5}}{8}$

C. $\frac{\sqrt{7}}{4}$

D. $\frac{\sqrt{5}}{3}$

Answer:

 [Watch Video Solution](#)

92. In a $\triangle XYZ$, let x, y, z be the length of the side opposite to angles X, Y, Z respectively and $2s = x + y + z$. If $\frac{s-x}{4} = \frac{s-y}{3} = \frac{s-z}{2}$ and area of the incircle of the triangle XYZ is $\frac{8\pi}{3}$, the area of $\triangle XYZ$ is

- A. $6\sqrt{6}$ sq. units
- B. $3\sqrt{6}$ sq. units
- C. $12\sqrt{6}$ sq. units
- D. $6\sqrt{3}$ sq. units

Answer:



[Watch Video Solution](#)

93. If $s-x/4 = s-y/3 = s-z/2$ and area of incircle of the triangle XYZ is $8(\pi)/3$ then The radius of the circumcircle of $\triangle XYZ$

- A. $\frac{35}{\sqrt{6}}$
- B. $\left(\frac{35}{2\sqrt{6}}\right)$

C. $\frac{35}{4\sqrt{6}}$

D. $\frac{35}{6\sqrt{6}}$

Answer:



[Watch Video Solution](#)

94. If $r = \sqrt{\frac{8}{3}}$ and $R = \frac{35}{4\sqrt{6}}$ then the value of $\sin \frac{X}{2} \sin \frac{Y}{2} \sin \frac{Z}{2} =$

A. $\frac{6}{35}$

B. $\frac{4}{35}$

C. $\frac{2}{35}$

D. $\frac{8}{35}$

Answer:



[Watch Video Solution](#)

95. If $x=5, y=6, z=7$. The value of $\sin^2\left(\frac{X+Y}{2}\right)$, is

A. $\frac{3}{5}$

B. $\frac{4}{5}$

C. $\frac{2}{5}$

D. $\frac{1}{5}$

Answer:



Watch Video Solution

Solved Mcq

1. P is a point on the altitude of $\triangle ABC$ such that $\angle CBP = \frac{B}{3}$, then $\frac{AP}{PC}$ is equal to



A. $2a \frac{\sin C}{3}$

B. $2b \frac{\sin A}{3}$

C. $2c \frac{\sin B}{3}$

D. $2c \frac{\sin C}{3}$

Answer:



[View Text Solution](#)

2. If p, q, r are the lengths of the internal bisectors of angles A, B, C respectively of a $\triangle ABC$, then



A. $\frac{1}{a} + \frac{1}{b} - \frac{1}{c}$

B. $\frac{1}{a} + \frac{1}{c} - \frac{1}{b}$

C. $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$

D. $\frac{1}{b} + \frac{1}{c} - \frac{1}{a}$

Answer:



[View Text Solution](#)

Section II Assertion Reason Type

1. Statement-1: In a triangle ABC, if $\sin^2 A + \sin^2 B + \sin^2 C = 2$, then one of the angles must be 90° .

Statement-2: In any triangle ABC

$$\cos 2A + \cos 2B + \cos 2C = -1 - 4 \cos A \cos B \cos C$$

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

2. Statement-1: In any $\triangle ABC$ if A is obtuse, then $\tan B \tan C < 1$

Statement-2: In any $\triangle ABC$, we have

$$\tan A + \tan B + \tan C = \tan A \tan B \tan C$$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

3. Let a and b denote the lengths of the legs of a right triangle with the following properties:

- (i) All three sides of the triangle are integers.
- (ii) The perimeter of the triangle is numerically equal to its area.
- (iii) $a < b$.

Statement-1: The number of such triangles is 2

Statement-2: Maximum possible perimeter of the triangle is 30° .

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

4. Statement-1: If the measures of two angles of a triangle are 45° and 60° , then the ratio of the smallest and the greatest sides are $(\sqrt{3} - 1) : 1$

Statement-2: The greatest side of a triangle is opposite to its greatest angle.

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement- 2 is True.

Answer:



[Watch Video Solution](#)

5. Statement-1: In a $\triangle ABC$,

$$(a + b + c) \left(\frac{\tan A}{2} + \frac{\tan B}{2} \right) = 2c \frac{\cot C}{2}$$

Statement-2: In a $\triangle ABC$, $a = b \cos C + c \cos B$

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

6. Statement-1: In a $\triangle ABC$, if

$$2a^2 + 4b^2 + c^2 = 4ab + 2ac, \text{ then } \cos A = \frac{1}{4}$$

Statement-2: In a ΔABC if $\cos A = \frac{1}{4}$, then

$$(a + b + c)(b + c - a) = \frac{5}{2}bc$$

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

7. Statement-1: If the lengths of two sides of a triangle are roots of the equation $x^2 - 12x + 35 = 0$ and the angle opposite to third side is obtuse, then the square of the length of the third side is greater than 74.

Statement-2: In a ΔABC , $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

 [Watch Video Solution](#)

8. Statement-1: In a $\triangle ABC$, if

$\tan A : \tan B : \tan C = 1 : 2 : 3$, then $A = 45^\circ$

Statement-2: If $p : q : r = 1 : 2 : 3$, then $p = 1$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

 [Watch Video Solution](#)

9. Statement-1: In any $\triangle ABC$, if $a : b : c = 4 : 5 : 6$, then $R:r=16:17$.

Statement-2: In any $\triangle ABC$, $\frac{R}{r} = \frac{abc}{4s}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement- 2 is True.

Answer:

 [Watch Video Solution](#)

10. Statement-1: In any $\triangle ABC$, $a \cos A + b \cos B + c \cos C \leq s$

Statement-2 : In any $\triangle ABC$, $\frac{\sin A}{2} \frac{\sin B}{2} \frac{\sin C}{2} \leq \frac{1}{8}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement- 2 is True.

Answer:

 [Watch Video Solution](#)

11. Statement-1: In $\triangle ABC$, $r_1 + r_2 + r_3 - r = 4R$

Statement-2: In $\triangle ABC$, $r_1r_2 + r_2r_3 + r_3r_1 = r^2$

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer:



[Watch Video Solution](#)

12. Statement-1: If the sines of the angles of a triangle are in A.P., then the altitudes of the triangle are also in A.P.

Statement-2: Twice the area of a triangle is equal to the product of the lengths of a side and the altitude on it.

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement-2 is True.

Answer: D

 [Watch Video Solution](#)

13. In $\triangle ABC$ it is given that $a:b:c = \cos A:\cos B:\cos C$

Statement-1: $\triangle ABC$ is equilateral.

Statement-2:

$\cos A$

$$= \frac{b^2 + c^2 - a^2}{2bc}, \cos B = \frac{c^2 + a^2 - b^2}{2ac}, \cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

- A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.
- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.
- C. Statement-1 is True, Statement-2 is False.
- D. Statement-1 is False, Statement- 2 is True.

Answer:



[Watch Video Solution](#)

Exercise

1. In triangle ABC, $b = \sqrt{3} c=1$ and $\angle A = 30^\circ$ then the measure of the largest angle of the triangle, is
- A. 60°
- B. 135°

C. 90°

D. 120°

Answer: D



Watch Video Solution

2. The area of the triangle ABC, in which $a=1, b=2, \angle C = 60^\circ$ is

A. 4sq.units

B. $\frac{1}{2}$ sq.units

C. $\frac{\sqrt{3}}{2}$ sq. units

D. $\sqrt{3}$ sq. units

Answer: C



Watch Video Solution

3. In a triangle ABC, vertex angles A, B, C and side BC are given. The area of ΔABC is

A. $\frac{s(s-a)(s-b)(s-c)}{2}$

B. $\frac{b^2 \sin C \sin A}{\sin B}$

C. $ab \sin C$

D. $\frac{1}{2} \frac{a^2 \sin B \sin C}{\sin A}$

Answer: D



Watch Video Solution

4. The area of the circle and the area of a regular polygon of n sides and the perimeter equal to the circle are in the ratio of

A. $\tan\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$

B. $\cos\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$

C. $\sin\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$

$$D. \cot\left(\frac{\pi}{n}\right) : \frac{\pi}{n}$$

Answer: A



Watch Video Solution

5. If $\cot\frac{A}{2} = \frac{b+c}{a}$, then the ΔABC , is

A. isosceles

B. equilateral

C. right angled

D. none of these

Answer: C



Watch Video Solution

6. In a ΔABC , $\tan\left(\frac{A}{2}\right) = \frac{5}{6}$, $\tan\left(\frac{C}{2}\right) = \frac{2}{5}$, then

A. a, b, c are in H.P

B. a, b, c are in A.P

C. b, a, c are in A.P

D. a, b, c are in G.P

Answer: B

 [Watch Video Solution](#)

7. In a triangle ABC , the line joining the circumcentre and incentre is parallel to BC , then $\cos B + \cos C$ is equal to:

A. $3/2$

B. 1

C. $3/4$

D. $1/2$

Answer: B

 [Watch Video Solution](#)

8. In a triangle ABC, $r =$

A. $(s - a) \frac{\tan B}{2}$

B. $(s - b) \frac{\tan B}{2}$

C. $(s - b) \frac{\tan C}{2}$

D. $(s - a) \frac{\tan C}{2}$

Answer: B

 [Watch Video Solution](#)

9. The ex-radii of a triangle r_1, r_2, r_3 are the harmonic progression, then the sides a, b, c are

A. in H.P.

B. in A.P.

C. in G.P.

D. none of these

Answer: B



[Watch Video Solution](#)

10. In any triangle ABC , prove that:

$$a^3 \cos(B - C) + b^3 \cos(C - A) + c^3 \cos(A - B) = 3abc$$

A. $3abc$

B. $3(a+b+c)$

C. $abc(a+b+c)$

D. 0

Answer: A



[Watch Video Solution](#)

11. If $c^2 = a^2 + b^2$, $2s = a + b + c$, then $4s(s - a)(s - b)(s - c)$

A. s^4

B. b^2c^2

C. c^2a^2

D. a^2, b^2

Answer: D



[Watch Video Solution](#)

12. The sides of a triangle are 13,14,15, then the radius of its in-circle is

A. $67/8$

B. $65/4$

C. 4

D. 24

Answer: C



[Watch Video Solution](#)

13. If $a \cos A = b \cos B$, then the triangle is

- A. equilateral
- B. right angled
- C. isosceles
- D. isosceles or right angled

Answer: D



[Watch Video Solution](#)

14. The in-radius of the triangle whose sides are 3,5,6, is

A. $\sqrt{8/7}$

B. $\sqrt{8}$

C. $\sqrt{7}$

D. $\sqrt{7/8}$

Answer: A



Watch Video Solution

15. In an equilateral triangle of side $2\sqrt{3}$ cms, the circum-radius ,is

A. 1cm

B. $\sqrt{3}$ cm

C. 2cm

D. $2\sqrt{3}$ cm

Answer: C



Watch Video Solution

16. If the angles of a triangle are in the ratio 1:2:3, the corresponding sides are in the ratio

A. 2 : 3 : 1

B. $\sqrt{3} : 2 : 1$

C. 2 : $\sqrt{3} : 1$

D. 1 : $\sqrt{3} : 2$

Answer: D



[Watch Video Solution](#)

17. In any $\triangle ABC$, $(\Sigma) \left(\frac{\sin^2 A + \sin A + 1}{\sin A} \right)$ is always greater than

A. 9

B. 3

C. 27

D. none of these

Answer: A



Watch Video Solution

18. In any $\triangle ABC$, $(\Sigma) \left(\frac{\sin^2 A + \sin A + 1}{\sin A} \right)$ is always greater than

A. 9

B. 3

C. 27

D. none of these

Answer: A



Watch Video Solution

19. In a right angled $\triangle ABC$ $\sin^2 A + \sin^2 B + \sin^2 C =$

A. 0

B. 1

C. -1

D. none of these

Answer: D



[Watch Video Solution](#)

20. In any $\triangle ABC$ if $2 \cos B = \frac{a}{c}$, then the triangle, is

A. right angled

B. equilateral

C. isosceles

D. none of these

Answer: C



[Watch Video Solution](#)

21. If in a $\triangle ABC$, $a \sin A = b \sin B$, then the triangle, is

- A. right angled
- B. equilateral
- C. isosceles
- D. none of these

Answer: A

 [Watch Video Solution](#)

22. In any $\triangle ABC$, if $\cot\left(\frac{A}{2}\right)$, $\cot\left(\frac{B}{2}\right)$, $\cot\left(\frac{C}{2}\right)$ are in A.P., then a, b, c are in

- A. A.P.
- B. G.P.
- C. H.P.
- D. none of these

Answer: A



Watch Video Solution

23. In any $\triangle ABC$ $b^2 \sin 2C + c^2 \sin 2B =$

A. a^2

B. $2a^2$

C. $3a^2$

D. $4a^2$

Answer: D



Watch Video Solution

24. If in a triangle ABC, $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$, then the triangle is

A. right angled

B. obtuse angled

C. equilateral

D. isosceles

Answer: C



[Watch Video Solution](#)

25. If in a $\triangle ABC$, $\Delta = a^2 - (b - c)^2$, then $\tan A =$

A. $\frac{15}{16}$

B. $\frac{8}{15}$

C. $\frac{8}{17}$

D. $\frac{1}{2}$

Answer: B



[Watch Video Solution](#)

26. If the angles A,B,C of a triangle are in A.P. and sides a,b,c are in G.P., then a^2, b^2, c^2 are in

A. A.P.

B. H.P.

C. G.P.

D. none of these

Answer: A



[Watch Video Solution](#)

27. In a triangle the lengths of the two larger sides are 10 and 9 respectively. If the angles are in A.P., the length of the third side can be (A) $5 - \sqrt{6}$ (B) $3\sqrt{3}$ (C) 5 (D) $5 + \sqrt{6}$

A. $5 \pm \sqrt{6}$

B. $3\sqrt{3}$

C. 5

D. $\sqrt{5} \pm 6$

Answer: A



Watch Video Solution

28. There can exist a triangle ABC satisfying the conditions :

A. $b \sin A = a, A < \frac{\pi}{2}$

B. $b \sin A > a, A > \frac{\pi}{2}$

C. $b \sin A > a, A < \frac{\pi}{2}$

D. $b \sin A > a, A > \frac{\pi}{2}, b > a$

Answer: A



Watch Video Solution

29. In a triangle the length of the two larger sides are 24 and 22, respectively. If the angles are in A.P., then the third side is

A. $12 + 2\sqrt{13}$

B. $12 - \sqrt{13}$

C. $2\sqrt{13} + 2$

D. $2\sqrt{13} - 2$

Answer: A



[Watch Video Solution](#)

30. If in a triangle $a \cos^2\left(\frac{C}{2}\right) + c \cos^2\left(\frac{A}{2}\right) = \frac{3b}{2}$, then the sides of the triangle are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A



[Watch Video Solution](#)

31. If twice the square of the diameter of the 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. 2

C. 4

D. 8

Answer: C



[Watch Video Solution](#)

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

A. $\pi/3$

B. $\pi/2$

C. $2\pi/3$

D. $5\pi/6$

Answer: C



Watch Video Solution

33. If in a triangle ABC,

$$2\frac{\cos A}{a} + \frac{\cos B}{b} + 2\frac{\cos C}{c} = \frac{a}{bc} + \frac{b}{ca},$$

then the value of the angle A, is

A. $\pi/3$

B. $\pi/4$

C. $\pi/2$

D. $\pi/6$

Answer: C



Watch Video Solution

34. If $A > 0$, $B > 0$ and $A+B=\frac{\pi}{3}$, then the maximum value of $\tan A \tan B$, is

A. $1/3$

B. 1

C. ∞

D. $1/\sqrt{3}$

Answer: A



Watch Video Solution

35. If $\cos(\theta - \alpha)$, $\cos \theta$, $\cos(\theta + \alpha)$ are in H.P., then $\cos \theta \sec(\alpha/2)$ is equal to

A. -1

B. $\pm \sqrt{2}$

C. ± 2

D. ± 3

Answer: B



[Watch Video Solution](#)

36. If $\sin \beta$ is the GM between $\sin \alpha$ and $\cos \alpha$, then $\cos 2\beta$ is equal to

A. $2 \sin^2\left(\frac{\pi}{4} - \alpha\right)$

B. $2 \cos^2\left(\frac{\pi}{4} - \alpha\right)$

C. $2 \cos^2\left(\frac{3\pi}{4} + 2\alpha\right)$

D. $2 \sin^2\left(\frac{\pi}{4} + \alpha\right)$

Answer: A



[Watch Video Solution](#)

37. If $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$ then the triangle ABC is right angled (b) obtuse angled (c) isosceles (d) equilateral

- A. right angled
- B. obtuse angled
- C. isosceles
- D. equilateral

Answer: B



[Watch Video Solution](#)

38. If in a $\triangle ABC$,

$(\sin A + \sin B + \sin C)(\sin A + \sin B - \sin C) = 3\sin A \sin B$ then

A. $A = 60^\circ$

B. $B = 60^\circ$

C. $C = 60^\circ$

D. none of these

Answer: C



Watch Video Solution

39. In a $\triangle ABC$, $\sin A + \sin B + \sin C = 1 + \sqrt{2}$ and $\cos A + \cos B + \cos C = \sqrt{2}$ if

,the triangle is

A. equilateral

B. isosceles

C. right angled

D. right angled isosceles

Answer: D

 [Watch Video Solution](#)

40. Point D, E are taken on the side BC of an acute angled triangle ABC,, such that $BD = DE = EC$. If

$\angle BAD = x$, $\angle DAE = y$ and $\angle EAC = z$ then the value of $\frac{\sin(x + y)\sin(y + z)}{\sin x \sin z}$ is -----

A. 1

B. 2

C. 4

D. none of these

Answer: C

 [Watch Video Solution](#)

41. In a triangle ABC, if $3a = b + c$, then the value of $\cot \frac{B}{2} \cot \frac{C}{2}$ is-

A. 1

B. $\sqrt{3}$

C. 2

D. none of these

Answer: C



[Watch Video Solution](#)

42. If $A + B + C = \pi$, $n \in \mathbb{Z}$, then $\tan nA + \tan nB + \tan nC$ is equal to

A. 0

B. 1

C. $\tan nA \tan nB \tan nC$

D. none of these

Answer: C



[Watch Video Solution](#)

43. If A,B,C are angles of a triangle ,then the minimum value of $\tan^2\left(\frac{A}{2}\right) + \tan^2\left(\frac{B}{2}\right) + \tan^2\left(\frac{C}{2}\right)$, is

A. 0

B. 1

C. 1/2

D. none of these

Answer: B



[Watch Video Solution](#)

44. In a triangle ABC , $\cos A + \cos B + \cos C = \frac{3}{2}$, then the triangle ,is

A. isosceles

B. right angled

C. equilateral

D. none of these

Answer: C



[Watch Video Solution](#)

45. In any triangle ABC, if $\cos A \cos B + \sin A \sin B \sin C = 1$ then prove that the triangle is an isosceles right angled.

A. isosceles

B. right angled

C. isosceles right angles

D. equilateral

Answer: C



[Watch Video Solution](#)

46. If in a triangle ABC, $\frac{b+c}{11} = \frac{c+a}{12} = \frac{a+b}{13}$ then $\cos A$ is equal to

A. $\frac{1}{5}$

B. $\frac{5}{7}$

C. $\frac{19}{35}$

D. none of these

Answer: A



Watch Video Solution

47. If p_1, p_2, p_3 are altitudes of a triangle ABC from the vertices A, B, C and !

the area of the triangle, then $p_1^2 + p_2^{-2} + p_3^{-2}$ is equal to

A. $\frac{a+b+c}{\Delta}$

B. $\frac{a^2 + b^2 + c^2}{4\Delta^2}$

C. $\frac{a^2 + b^2 + c^2}{\Delta^2}$

D. none of these

Answer: B



Watch Video Solution

48. If p_1, p_2, p_3 are altitudes of a triangle ABC from the vertices A,B,C and Δ is the area of the triangle, then $p_1 \cdot p_2 \cdot p_3$ is equal to

A. abc

B. $8R$

C. $a^2b^2c^2$

D. $\frac{a^2 \cdot b^2 \cdot c^2}{8R^3}$

Answer: D



Watch Video Solution

49. P_1, P_2, P_3 are altitudes of a triangle ABC from the vertices A, B, C and Δ is the area of the triangle,

The value of $P_1^{-1} + P_2^{-1} + P_3^{-1}$ is equal to-

A. $\frac{s - a}{!}$

B. $\frac{s - b}{!}$

C. $\frac{s - c}{!}$

D. $\frac{s}{!}$

Answer: C



Watch Video Solution

50. If median of the $\triangle ABC$ through A is perpendicular to BC, then which one of the following is correct ?

A. $\tan A + \tan B = 0$

B. $2\tan A + \tan B = 0$

C. $\tan A + 2\tan B = 0$

D. none of these

Answer: C



Watch Video Solution

51. In $\triangle ABC$ if $\frac{\sin A}{\sin C} = \frac{\sin(A - B)}{\sin(B - C)}$, then a^2, b^2, c^2 are in :

A. a, b, c are in A.P

B. a^2, b^2, c^2 are in A.P

C. a, b, c are in H.P

D. a^2, b^2, c^2 are in H.P

Answer: B



Watch Video Solution

52. If in a $\triangle ABC$, $a \tan A + b \tan B = (a + b) \tan\left(\frac{A + B}{2}\right)$, then

A. $A = B$

B. $A = -B$

C. $A = 2B$

D. $B = 2A$

Answer: A



Watch Video Solution

53. If in a $\triangle ABC$, $\cos A = \frac{\sin B}{2\sin C}$ then the $\triangle ABC$, is

A. equilateral

B. isosceles

C. right angled

D. none of these

Answer: B



Watch Video Solution

54. If in a triangle ABC, $\frac{a^2 - b^2}{a^2 + b^2}$ then the triangle is

- A. right angled or isosceles
- B. right angled and isosceles
- C. equilateral
- D. none of these

Answer: A



Watch Video Solution

55. If in a triangle ABC, $b + c = 3a$, then $\tan\left(\frac{B}{2}\right)\tan\left(\frac{C}{2}\right)$ is equal to

- A. $1/2$
- B. $1/3$
- C. $1/4$
- D. $1/5$

Answer: A



Watch Video Solution

56. Let ABC be a triangle such that $\angle A = 45^\circ$, $\angle B = 75^\circ$, then $a + c\sqrt{2}$ is equal to

A. 0

B. b

C. $2b$

D. $-b$

Answer: C



Watch Video Solution

57. If in a $\triangle ABC$, $\cos A + 2\cos B + \cos C = 2$, then a, b, c are in

A. A.P.

B. H.P.

C. G.P

D. none of these

Answer: A



Watch Video Solution

58. If the altitudes of a triangle are in A.P, then the sides of the triangle are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: C

 [Watch Video Solution](#)

59. In any $\triangle ABC$, the distance of the orthocentre from the vertices A, B, C are in the ratio

A. $\sin A : \sin B : \sin C$

B. $\cos A : \cos B : \cos C$

C. $\tan A : \tan B : \tan C$

D. none of these

Answer: B

 [Watch Video Solution](#)

60. If R is the radius of circumscribing circle of a regular polygon of n-sides, then R =

A. $\frac{a}{2} \sin\left(\frac{\pi}{n}\right)$

B. $\frac{a}{2} \cos\left(\frac{\pi}{n}\right)$

C. $\frac{a}{2} \cos ec\left(\frac{\pi}{n}\right)$

D. $\frac{a}{2} \cos ec\left(\frac{\pi}{n}\right)$

Answer: C



Watch Video Solution

61. If r is the radius of inscribed circle of a regular polygon of n -sides ,then r is equal to

A. $\frac{a}{2} \cot\left(\frac{\pi}{2n}\right)$

B. $\frac{a}{2} \cot\left(\frac{\pi}{n}\right)$

C. $\frac{a}{2} \tan\left(\frac{\pi}{n}\right)$

D. $\frac{a}{2} \cos\left(\frac{\pi}{n}\right)$

Answer: B



Watch Video Solution

62. The area of a regular polygon of n sides is (where r is inradius, R is circumradius, and a is side of the triangle) $\frac{nR^2}{2}\sin\left(\frac{2\pi}{n}\right)$ (b) $nr^2 \tan\left(\frac{\pi}{n}\right)$ $\frac{na^2}{4} \frac{\cot \pi}{n}$ (d) $nR^2 \tan\left(\frac{\pi}{n}\right)$

A. $\frac{nR^2}{2}\sin\left(\frac{2\pi}{n}\right)$

B. $nr^2 \tan\left(\frac{2\pi}{2n}\right)$

C. $\frac{nr^2}{2}\sin\left(\frac{2\pi}{n}\right)$

D. $nR^2 \tan\left(\frac{\pi}{n}\right)$

Answer: A



Watch Video Solution

63. If r, r_1, r_2, r_3 have their usual meanings, the value of $\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3}$,

is

A. 1

B. 0

C. $\frac{1}{r}$

D. none of these

Answer: C



Watch Video Solution

64. If p_1, p_2, p_3 are respectively the perpendicular from the vertices of a triangle to the opposite sides, then find the value of $p_1 p_2 p_3$.

A. $\frac{a^2 b^2 c^2}{R^2}$

B. $\frac{a^2 b^2 c^2}{4R^2}$

C. $\frac{4a^2 b^2 c^3}{R^2}$

D. $\frac{a^2 b^2 c^2}{8R^2}$

Answer: D



Watch Video Solution

65. If p_1, p_2, p_3 are respectively the perpendiculars from the vertices of a triangle to the opposite sides, then $\frac{\cos A}{p_1} + \frac{\cos B}{p_2} + \frac{\cos C}{p_3}$ is equal to

A. $1/r$

B. $1/R$

C. $1/!$

D. none of these

Answer: B



Watch Video Solution

66. If in $\triangle ABC$, $8R^2 = a^2 + b^2 + c^2$, then the triangle ABC is

A. right angled

B. isosceles

C. equilateral

D. none of these

Answer: A



[Watch Video Solution](#)

67. If A_1, A_2, A_3 denote respectively the areas of an inscribed polygon of $2n$ sides, inscribed polygon of n sides and circumscribed polygon of n sides, then A_1, A_2, A_3 are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: B



[Watch Video Solution](#)

68. If the angles of a triangle are in A.P. with common difference equal $1/3$ of the least angle, the sides are in the ratio

A. $\sqrt{2} : 2\sqrt{3} : \sqrt{6} + \sqrt{2}$

B. $2\sqrt{2} : \sqrt{3} : \sqrt{6} - \sqrt{2}$

C. $2\sqrt{2} : 2\sqrt{3} : \sqrt{6} - \sqrt{2}$

D. $2\sqrt{2} : 2\sqrt{3} : \sqrt{6} + \sqrt{2}$

Answer: D



[Watch Video Solution](#)

69. In a triangle ABC, $A = 8$, $b = 10$ and $c = 12$. What is the angle C equal to ?

A. $A/2$

B. $2A$

C. $3A$

D. none of these

Answer: B



Watch Video Solution

70. If the sides a, b, c of a triangle ABC are the roots of the equation

$$x^3 - 13x^2 + 54x - 72 = 0, \text{ then the value of } \frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c}$$

is equal to :

A. $\frac{169}{144}$

B. $\frac{61}{72}$

C. $\frac{61}{144}$

D. $\frac{169}{72}$

Answer: C



Watch Video Solution

71. The area of a $\triangle ABC$ is $b^2 - (c - a)^2$. Then $\tan B =$

A. $\frac{4}{3}$

B. $\frac{3}{4}$

C. $\frac{8}{15}$

D. none of these

Answer: C



[Watch Video Solution](#)

72. In a ΔABC , $\frac{\sin A}{\sin C} = \frac{\sin(A - B)}{\sin(B - C)}$, then a^2, b^2, c^2 are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A



[Watch Video Solution](#)

73. If in a triangle ABC , $3 \sin A = 6 \sin B = 2\sqrt{3} \sin C$, then the angle A is

A. 0°

B. 30°

C. 60°

D. 90°

Answer: D



[Watch Video Solution](#)

74. The side of a Δ are in AP. And its area is $\frac{3}{5} \times$ (area of an equilateral triangle of the same perimeter). Find the ratio of its sides.

A. $1 : 2 : 3$

B. $3 : 5 : 7$

C. 1 : 3 : 5

D. none of these

Answer: B



[Watch Video Solution](#)

75. In a triangle

$$\sin^4 A + \sin^4 B + \sin^4 C = \sin^2 B \sin^2 C + 2 \sin^2 C \sin^2 A + 2 \sin^2 A \sin^2 B$$

, then its angle A is equal to-

A. $\frac{\pi}{6}, \frac{5\pi}{6}$

B. $\frac{\pi}{3}, \frac{5\pi}{6}$

C. $\frac{5\pi}{6}, \frac{2\pi}{3}$

D. none of these

Answer: A



[Watch Video Solution](#)

76. In any triangle ABC, $\frac{\frac{\tan A}{2} - \frac{\tan B}{2}}{\frac{\tan A}{2} + \frac{\tan B}{2}}$ is equal to

A. $\frac{a - b}{a + b}$

B. $\frac{a - b}{c}$

C. $\frac{a - b}{a + b + c}$

D. $\frac{c}{a + b}$

Answer: B



Watch Video Solution

77. If the sides a, b and c of a $\triangle ABC$ are in A.P., then

$$\left(\frac{\tan A}{2} + \frac{\tan C}{2} \right) : \frac{\cot B}{2}, \text{ is}$$

A. 3 : 2

B. 1 : 2

C. 3 : 4

D. none of these

Answer: D



[Watch Video Solution](#)

78. If the sides of the triangle are the roots of the equation $x^3 - 2x^2 - x - 16 = 0$, then the product of the in-radius and circum-radius of the triangle is

A. 3

B. 6

C. 4

D. 2

Answer: C



[Watch Video Solution](#)

79. If AD, BE and CF are the medians of a $\triangle ABC$, then

$(AD^2 + BE^2 + CF^2) : (BC^2 + CA^2 + AB^2)$ is equal to

A. 4:3

B. 3:2

C. 3:4

D. 2:3

Answer: C



[Watch Video Solution](#)

80. If a $\triangle ABC$ is right angled at B, then the diameter of the incircle of the triangle is

A. $\frac{\pi}{4}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. none of these

Answer: C



[Watch Video Solution](#)

81. If a^2, b^2, c^2 are in A.P., then which of the following is also in A.P.?

A. $\sin A, \sin B, \sin C$

B. $\tan A, \tan B, \tan C$

C. $\cot A, \cot B, \cot C$

D. none of these

Answer: C



[Watch Video Solution](#)

82. If in a $\triangle ABC$,

$\sin^3 A + \sin^3 B + \sin^3 C = 3 \sin A \sin B \sin C$, then

$$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$$

A. 0

B. $(a + b + c)^3$

C. $(a+b+c)(ab+bc+ca)$

D. none of these

Answer: A



[Watch Video Solution](#)

83. If the ex-radii of a triangle are in H.P., then the corresponding sides are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A

 [Watch Video Solution](#)

84. If I is the incentre of a $\triangle ABC$, then $IA : IB : IC$ is equal to

A. $\cos ec \frac{A}{2} : \cos ec \frac{B}{2} : \cos ec \frac{C}{2}$

B. $\frac{\sin A}{2} : \frac{\sin B}{2} : \frac{\sin C}{2}$

C. $\frac{\sec A}{2} : \frac{\sec B}{2} : \frac{\sec C}{2}$

D. none of these

Answer: A

 [Watch Video Solution](#)

85. In a $\triangle ABC$, the HM of the ex-radii is equal to

A. $3r$

B. $2R$

C. $R + r$

D. none of these

Answer: A



[Watch Video Solution](#)

86. In a $\triangle ABC$ if $r_1 : r_2 : r_3 = 2 : 4 : 6$, then $a : b : c =$

A. $3 : 5 : 7$

B. $1 : 2 : 3$

C. $5 : 8 : 7$

D. none of these

Answer: C



Watch Video Solution

87. If in a $\triangle ABC$, $\angle A = \pi/3$ and AD is a median , then

A. $2AD^2 = b^2 + c^2 + bc$

B. $4AD^2 = b^2 + c^2 + bc$

C. $6AD^2 = b^2 + c^2 + bc$

D. none of these

Answer: B



Watch Video Solution

88. In a $\triangle ABC$ $\frac{\cos^2 A}{2} + \frac{\cos^2 B}{2} + \frac{\cos^2 C}{2} =$

A. $2 - \frac{r}{R}$

B. $2 - \frac{r}{2R}$

C. $2 + \frac{r}{2R}$

D. none of these

Answer: C



Watch Video Solution

89. The base of a triangle is 80cm and one of the base angles is 60° . If the sum of the lengths of the other two sides is 90cm, then the length of the shortest side is

A. 15cm

B. 19cm

C. 21cm

D. 17cm

Answer: D



Watch Video Solution

90. In a $\triangle ABC$ if $r_1 = 16$, $r_2 = 48$ and $r_3 = 24$, then its in-radius, is

A. 7

B. 8

C. 6

D. none of these

Answer: B



Watch Video Solution

91. किसी $\triangle ABC$ में सिद्ध करे कि

$$\frac{(a + b + c)^2}{a^2 + b^2 + c^2} = \frac{\cot \frac{A}{2} + \cot \frac{B}{2} + \cot \frac{C}{2}}{\cot A + \cot B + \cot C}$$

A. $\frac{(a + b + c)^2}{a^2 + b^2 + c^2}$

B. $\frac{a^2 + b^2 + c^2}{(a + b + c)^2}$

C. s

D. !

Answer: A



[Watch Video Solution](#)

92. In a $\triangle ABC$ if $a = 26$, $b = 30$ and $\cos C = \frac{63}{65}$, then $r_2 =$

A. 84

B. 45

C. 48

D. 24

Answer: C



[Watch Video Solution](#)

93. In a $\triangle ABC$ if $a = 13$, $b = 14$ and $c = 15$, then reciprocals of r_1, r_2, r_3 are in the ratio

A. 6 : 7 : 8

B. 6 : 7 : 8

C. 8 : 7 : 6

D. none of these

Answer: C



[Watch Video Solution](#)

94. In a $\triangle ABC$, if $\sin A$ and $\sin B$ are the roots of the equation $c^2x^2 - c(a+b)x + ab = 0$, then find $\angle C$.



[Watch Video Solution](#)

95. If a, b, c denote the sides of a $\triangle ABC$ and the equations $ax^2 + bx + c = 0$ and $x^2 + \sqrt{2}x + 1 = 0$ have a common root, then $\angle C =$

A. 30°

B. 45°

C. 90°

D. 60°

Answer: B



[Watch Video Solution](#)

96. In a $\triangle ABC$ if $b + c = 2a$ and $\angle A = 60^\circ$ then $\triangle ABC$ is

A. equilateral

B. right angled

C. isosceles

D. scalene

Answer: A



[Watch Video Solution](#)

97. In a $\triangle ABC$, if $b = 20$, $c = 21$ and $\sin A = \frac{3}{5}$, then the value of a is

A. 12

B. 13

C. 14

D. 15

Answer: B



[Watch Video Solution](#)

98. Let A , B and C are the angles of a plain triangle and $\tan\left(\frac{A}{2}\right) = \frac{1}{3}$, $\tan\left(\frac{B}{2}\right) = \frac{2}{3}$. then $\tan\left(\frac{C}{2}\right)$ is equal to

A. $7/9$

B. $2/9$

C. $1/3$

D. $2/3$

Answer: A



[Watch Video Solution](#)

Chapter Test

1. If the sides of a triangle are in the ratio $3 : 7 : 8$, then find $R : r$

A. $2 : 7$

B. $7 : 2$

C. 3:7

D. 7:3

Answer: B



[Watch Video Solution](#)

2. The area of the rectangle polygen of n sides is (where R is the radius of the circumpolygon)

A. $\frac{1}{2}R^2 \sin\left(\frac{2\pi}{n}\right)$

B. $\frac{n}{2}R^2 \sin\left(\frac{\pi}{n}\right)$

C. $\frac{n}{2}R \sin\left(\frac{2\pi}{n}\right)$

D. $\frac{nR^2}{2} \sin\left(\frac{2\pi}{n}\right)$

Answer: D



[Watch Video Solution](#)

3. If the angles of a triangle are 30° and 45° and the included side of $(\sqrt{3} + 1)$ cms, then the area of the triangle, is

A. $\frac{1}{\sqrt{3} - 1}$

B. $\sqrt{3} + 1$

C. $\frac{1}{\sqrt{3} + 1}$

D. none of these

Answer: A



Watch Video Solution

4. In a triangle ABC, $\angle B = \frac{\pi}{3}$ and $\angle C = \frac{\pi}{4}$ let D divide BC internally in the ratio 1:3. Then $\frac{\sin(\angle BAD)}{\sin(\angle CAD)}$ is equal to

A. $\frac{1}{\sqrt{6}}$

B. $\frac{1}{3}$

C. $\frac{1}{\sqrt{3}}$

D. $\sqrt{\left(\frac{2}{3}\right)}$

Answer: A



Watch Video Solution

5. If A is the area and $2s$ the sum of the sides of a triangle, then

A. $A \leq \frac{s^2}{3\sqrt{3}}$

B. $A \leq \frac{s^2}{2}$

C. $A > \frac{s^2}{\sqrt{3}}$

D. none of these

Answer: A



Watch Video Solution

6. If in a triangle ABC, right angled at B, $s-a=3$, $s-c=2$, then the values of a and c are respectively

A. 2,3

B. 3,4

C. 4,3

D. 6,8

Answer: B



[Watch Video Solution](#)

7. If the sides of a triangle are a, b and $\sqrt{a^2 + ab + b^2}$, then find the greatest angle

A. 60°

B. 90°

C. 120°

D. 135°

Answer: C



Watch Video Solution

8. In a $\triangle ABC$ $\sum (b + c) \frac{\tan A}{2} \tan\left(\frac{B - C}{2}\right) =$

A. a

B. b

C. c

D. 0

Answer: D



Watch Video Solution

9. In $\triangle ABC$, $\angle A = \frac{\pi}{3}$ and $b:c = 2:3$, $\tan \theta = \frac{\sqrt{3}}{5}$, $0 < \theta < \frac{\pi}{2}$

then

A. $B = 60^\circ + \theta$

B. $C = 60^\circ + \theta$

C. $C = 60^\circ - \theta$

D. $C = 60^\circ - \theta$

Answer: B



Watch Video Solution

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

A. 53°

B. 113°

C. 87°

D. none of these

Answer: B



[Watch Video Solution](#)

11. If the angles A, B, C (in that order) of triangle ABC are in arithmetic progression, and $L = \lim_{A \rightarrow C} \frac{\sqrt{3 - 4 \sin A \sin C}}{|A - C|}$ then find the value of $100L^2$.

A. 1

B. 2

C. 3

D. 4

Answer: A



[Watch Video Solution](#)

12. If the radius of the incircle of a triangle with sides $5k$, $6k$ and $5k$ is 6 , then k is equal to

A. 3

B. 4

C. 5

D. 6

Answer: B



[Watch Video Solution](#)

13. Two sides of a triangle are $2\sqrt{2}$ and $2\sqrt{3}cm$ and the angle opposite to the shorter side of the two is $\frac{\pi}{4}$. The largest possible length of the third side is

A. $(\sqrt{6} + \sqrt{2})cm$

B. $(\sqrt{6} + \sqrt{2})cm$

C. $(\sqrt{6} - \sqrt{2})\text{cm}$

D. none of these

Answer: A



[Watch Video Solution](#)

14. In a $\triangle ABC$, $a = 13\text{cm}$, $b = 12$ and $c = 5\text{cm}$ The distance of A from BC is

A. $\frac{144}{13}$

B. $\frac{65}{12}$

C. $\frac{60}{13}$

D. $\frac{25}{13}$

Answer: C



[Watch Video Solution](#)

15. In a $\triangle ABC$, $B = \frac{\pi}{8}$, $C = \frac{5\pi}{8}$. The altitude from A to the side BC, is

A. $\frac{a}{2}$

B. $2a$

C. $\frac{1}{2}(b + c)$

D. $b+c$

Answer: A



Watch Video Solution

16. In a $\triangle ABC$, $A = \frac{2\pi}{3}$, $b - c = 3\sqrt{3}cm$ and

$area(\triangle ABC) = \frac{9\sqrt{3}}{2}cm^2$. Then a is

A. $6\sqrt{3}$

B. $9cm$

C. $18cm$

D. $12cm$

Answer: B



Watch Video Solution

17. In ΔABC if $a = (b - c)\sec \theta$ then $\frac{2\sqrt{bc}}{b - c} \sin\left(\frac{A}{2}\right) =$

A. $\cos \theta$

B. $\cot \theta$

C. $\tan \theta$

D. $\sin \theta$

Answer: C



Watch Video Solution

18. In a ΔABC , $(a + b + c)(b + c - a) = \lambda bc$. (where symbols have their usual meaning) & $\lambda \in I$, then greatest value of λ is

A. $\lambda < 0$

B. $\lambda > 4$

C. $\lambda > 0$

D. $0 < \lambda < 4$

Answer: D

 [Watch Video Solution](#)

19. If in $\triangle ABC$, $a=2b$ and $A=3B$, then A is equal to

A. 90°

B. 60°

C. 30°

D. 45°

Answer: A

 [Watch Video Solution](#)

20. Let the angles A , B and C of triangle ABC be in AP . and let $b:c$ be $\sqrt{3}:\sqrt{2}$. Find angle A .

A. 75°

B. 45°

C. 60°

D. 15°

Answer: A



[Watch Video Solution](#)

21. If in a $\triangle ABC$, AD , BE and CF are the altitudes and R is the circumradius, then find the radius of the DEF.

A. $\frac{R}{2}$

B. $2R$

C. R

D. $\frac{3}{2}R$

Answer: A



[Watch Video Solution](#)

22. If in a $\triangle ABC = \frac{a}{\cos A} = \frac{b}{\cos B}$, then

A. $2 \sin A \sin B \sin C = 1$

B. $\sin^2 A + \sin^2 B = \sin^2 C$

C. $2 \sin A \cos B = \sin C$

D. none of these

Answer: C



[Watch Video Solution](#)

23. In a $\triangle ABC$, $\frac{s}{R} =$

A. $\sin A + \sin B + \sin C$

B. $\cos A + \cos B + \cos C$

C.

D. none of these

Answer: A



[Watch Video Solution](#)

24. If in a $\triangle ABC$, $A = \frac{\pi}{3}$ and AD is the median, then

A. $2AD^2 = b^2 + c^2 + bc$

B. $4AD^2 = b^2 + c^2 + bc$

C. $6AD^2 = b^2 + c^2 + bc$

D. none of these

Answer: B



[Watch Video Solution](#)

25. If any $\triangle ABC$, the value of

$$a(b^2 + c^2)\cos A + b(c^2 + a^2)\cos B + c(a^2 + b^2)\cos C =$$

A. $3abc^2$

B. $3a^2bc$

C. $3abc$

D. $3ab^2C$

Answer: C



[Watch Video Solution](#)

26. If the angle of a right angled triangle are in A.P. then the ratio of the in-radius and the perimeter, is

A. $(2 - \sqrt{3}) : 2\sqrt{3}$

B. $1 : 8\sqrt{3}(2 + \sqrt{3})$

C. $(2 + \sqrt{3}) : 4\sqrt{3}$

D. none of these

Answer: A



Watch Video Solution

27. The sum of the radii of inscribed and circumscribed circle of an n sides regular polygon of side a is

A. $\frac{a}{4} \cot \frac{\pi}{2n}$

B. $a \cot \frac{\pi}{n}$

C. $\frac{a}{2} \cot \frac{\pi}{2n}$

D. $a \cot \frac{\pi}{2n}$

Answer: D

 [Watch Video Solution](#)

28. If $0 < x < \frac{\pi}{2}$ then the largest angle of a triangle whose sides are 1, $\sin x$, $\cos x$ is

A. $\frac{\pi}{3}$

B. $\frac{\pi}{2}$

C. x

D. $\frac{\pi}{2} - x$

Answer: B

 [Watch Video Solution](#)

29. The sides of a triangle are $3x + 4y$, $3y$ and $5x + 5y$ where $x, y > 0$, then the triangle is-

A. right angled

B. obtuse angled

C. equilateral

D. none of these

Answer: B



[Watch Video Solution](#)

30. The perimeter of a triangle is 16 cm. One of the sides is of length 6 cm.

If the area of the triangle is 12 sq. cm, then the triangle is

A. right angled

B. isoscles

C. equilateral

D. scalene

Answer: B



[Watch Video Solution](#)

31. In a $\triangle ABC$, if $\frac{a}{b^2 - c^2} + \frac{c}{b^2 - a^2} = 0$, then $\angle B =$

A. $\frac{\pi}{2}$

B. $\frac{\pi}{4}$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{3}$

Answer: D



Watch Video Solution

32. In a $\triangle ABC$, $a^2 \sin 2C + c^2 \sin 2A =$

A. Δ

B. 2Δ

C. 3Δ

D. 4Δ

Answer: D



Watch Video Solution

33. In a $\triangle ABC$, $\frac{\cos C + \cos A}{c + a} + \frac{\cos B}{b} =$

A. $\frac{1}{a}$

B. $\frac{1}{b}$

C. $\frac{1}{c}$

D. $\frac{c + a}{b}$

Answer: B



Watch Video Solution

34. In a $\triangle ABC$, sides a, b, c are in A.P. then $\tan \frac{A}{2} \tan \frac{C}{2}$

A. $1/4$

B. $1/3$

C. 3

D. 4

Answer: B



Watch Video Solution

35. In a triangle ABC, $\cos A + \cos B + \cos C =$

A. $1 + \frac{r}{R}$

B. $1 - \frac{r}{R}$

C. $1 - \frac{R}{r}$

D. $1 + \frac{R}{r}$

Answer: A



Watch Video Solution

36. If $A + B + C = \pi$, and $\cos A = \cos B \cdot \cos C$, then $\cot B \cdot \cot C =$

A. 2

B. 3

C. $1/2$

D. 5

Answer: C



[Watch Video Solution](#)

37. In triangle

$$ABC, a(b^2 + c^2) \cos A + b(c^2 + a^2) \cos B + c(a^2 + b^2) \cos C =$$

A. abc

B. $2abc$

C. $3abc$

D. $4abc$

Answer: C



[Watch Video Solution](#)

38. The sides of a triangle are $x^2 + x + 1$, $2x + 1$, and $x^2 - 1$. Prove that the greatest angle is 120° .

A. 120°

B. 60°

C. 40°

D. 30°

Answer: A



[Watch Video Solution](#)

39. In a $\triangle ABC$, if $C = 60^\circ$, then $\frac{a}{b+c} + \frac{b}{c+a} =$

A. 2

B. 1

C. 4

D. none of these

Answer: B



[Watch Video Solution](#)

40. In a $\triangle ABC$, if a, c, b are in A.P. then the value of $\frac{a \cos B - b \cos A}{a - b}$, is

A. 3

B. 2

C. 1

D. none of these

Answer: B



[Watch Video Solution](#)

41. If a triangle is right angled at B, then the diameter of the incircle of the triangle, is

A. $c+a-b$

B. $2(c+a-b)$

C. $c+a-2b$

D. $c+a+2b$

Answer: A



[Watch Video Solution](#)

42. If the angle of a righta angled triangle are in A.P. then the ratio of the in -radius and the perimeter, is

A. $(2 + \sqrt{3}), 2\sqrt{3}$

B. $(2 + \sqrt{3}), \sqrt{3}$

C. $(2 - \sqrt{3}) : 2\sqrt{3}$

D. $(2 - \sqrt{3}) : 4\sqrt{3}$

Answer: C



Watch Video Solution

43. If the angles of a triangle are in the ratio 7 : 2 : 1, then prove that the ratio of smallest side to the largest side is $\sqrt{5} - 1 : \sqrt{5} + 1$.

A. $(\sqrt{5} + 1) : (\sqrt{5} - 1)$

B. $(\sqrt{5} - 1) : (\sqrt{5} + 1)$

C. $(\sqrt{5} + 2) : (\sqrt{5} - 2)$

D. $(\sqrt{5} - 2) : (\sqrt{5} + 2)$

Answer: B

 [Watch Video Solution](#)

44. If in $\triangle ABC$, $a = 5$, $b = 4$ and $\cos(A - B) = \frac{31}{32}$, then

A. $1/4$

B. $1/8$

C. $1/6$

D. $1/2$

Answer: B

 [Watch Video Solution](#)

45. In a $\triangle ABC$ if $c = (a + b)\sin\theta$ and $\cos\theta = \frac{k\sqrt{ab}}{a + b}$, then $k =$

A. $2 \cos \frac{C}{2}$

B. $2 \cos \frac{B}{2}$

C. $2 \cos \frac{A}{2}$

D. $\cos \frac{C}{2}$

Answer: A



Watch Video Solution

46. In $\triangle ABC$, if $\frac{s-a}{\Delta} = \frac{1}{8}$, $\frac{s-b}{\Delta} = \frac{1}{12}$ and $\frac{s-c}{\Delta} = \frac{1}{24}$, then

$b =$

A. 16

B. 20

C. 24

D. 28

Answer: A



Watch Video Solution

47. In a triangle ABC if $2a = \sqrt{3}b + c$, then possible relation is

A. $c^2 = a^2 + b^2 - ab$

B. $a^2 = b^2 + c^2$

C. $b^2 = a^2 + c^2 - \sqrt{3}ac$

D. none of these

Answer: B



Watch Video Solution

48. If in a triangle ABC , $a \cos^2\left(\frac{C}{2}\right) \cos^2\left(\frac{A}{2}\right) = \frac{3b}{2}$, then the sides a , b , and c are in A.P. b. are in G.P. c. are in H.P. d. satisfy $a + b = \dots$

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A



[Watch Video Solution](#)

49. The sides of a right angled triangle are in A, P , then they are in the ratio

A. 3 : 4 : 5

B. 4 : 5 : 6

C. 3 : 4 : 6

D. none of these

Answer: A



[Watch Video Solution](#)

50. In a triangle ABC , $B = 90^\circ$ then the value of $\tan\left(\frac{A}{2}\right) =$

A. $\sqrt{\frac{b+c}{b-c}}$

B. $\sqrt{\frac{b-c}{b+c}}$

C. $\sqrt{\frac{a+c}{a-c}}$

D. $\sqrt{\frac{a-c}{a+c}}$

Answer: B



Watch Video Solution

51. In a triangle ABC , $B = 90^\circ$ then the value of $\tan\left(\frac{A}{2}\right) =$

A. xyz

B. x^2yz

C. $x^2y^2z^2$

D. none of these

Answer: D

 [Watch Video Solution](#)

52. In a $\triangle ABC$ if $a = 5$, $b = 4$ and $\tan \frac{C}{2} = \frac{\sqrt{7}}{3}$ then $c =$

A. $\sqrt{6}$

B. $\sqrt{5}$

C. 6

D. 5

Answer: C

 [Watch Video Solution](#)

53. In a $\triangle ABC$, if $\angle C = 60^\circ$ then $\frac{a}{b+c} + \frac{b}{c+a} =$

A. 2

B. 4

C. 3

D. 1

Answer: D



Watch Video Solution

54. If p_1, p_2, p_3 are altitude of a triangle ABC from the vertices A,B,C and Δ

the area of the triangle, then $\frac{1}{p_1^2} + \frac{1}{p_2^2} + \frac{1}{p_3^2} =$

A. $\frac{\cot A + \cos B + \cot C}{\Delta}$

B. $\frac{\Delta}{\cot A + \cos B + \cot C}$

C. $\Delta(\cot A + \cos B + \cot C)$

D. none of these

Answer: A



Watch Video Solution

55. In $\triangle ABC$ with usual notation $\frac{r_1}{bc} + \frac{r_2}{ca} + \frac{r_3}{ab}$ is

A. $\frac{1}{2R} - \frac{1}{r}$

B. $2R-r$

C. $r-2R$

D. $\frac{1}{r} - \frac{1}{2R}$

Answer: D



Watch Video Solution