MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

PROPERTIES OF TRIANGLES

SOLVED EXAMPLES

1. In ΔABC, if 2R=$r_1 - r$then $\angle A =$

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D

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2. In ΔABC, $\frac{b^2-c^2}{a^2}\sin^2 A + \frac{c^2+a^2}{b^2}\sin^2 B =$

A. $b^2 - a^2$

B. $a^2 + b^2$

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

D. $\frac{a^2+b^2}{4R^2}$

Answer: C

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3. In ΔABC, if $\cot\frac{A}{2} : \cot\frac{B}{2} : \cot\frac{C}{2} = 1:4:15$, then the greatest angle of the triangle is

A. 60°

B. 90°

C. 120°

D. 135°

Answer: C

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4. Prove that $\frac{1+\cos(A-B)\cos C}{1+\cos(A-C)\cos B} = \frac{a^2+b^2}{a^2+c^2}$

A. a^2+b^2

B. a^2+c^2

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

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

Answer: D

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

A. $\sqrt{2}$

B. $\sqrt{3}$

C. 2

D. 3

Answer: B

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6. In ΔABC, if Sin A and sin B are the roots of the equation $c^2x^2 - c(a+b)x + ab = 0$, then sin C=

A. 0

B. $1/2$

C. $1/\sqrt{2}$

D. 1

Answer: D

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7. If the sum of the squares of the sides of a triangle ABC is equal to twice the square of its circum diameter, then $\sin^2 A + \sin^2 B + \sin^2 C$=

A. 4

B. 3

C. 1

D. 2

Answer: D

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8. The roots of $x^2 - 2\sqrt{3}x + 2 = 0$ represent two sides of a triangle. IF the angle between them is $\pi/3$, then the perimeter of the triangle is

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

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

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

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

Answer: B

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

A. 15

B. 17

C. 19

D. 21

Answer: B

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10. In a triangle ABC, if $B = 30^\circ$ and $c = \sqrt{3}b$, then A can be equal to

A. 45°

B. 60°

C. 90°

D. 120°

Answer: C

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11. In a triangle ABC, if A,B, C are in A.P and b:c =$\sqrt{3}:\sqrt{2}$, then

A. $\sin(2C - A) = \sin(B/4)$

B. $\sin(A - C) = \sin(B/4)$

C. $\sin(A + C) = \cos 2R$

D. $\cos(A - C) = \sin(B/2)$

Answer: A

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12. In a ΔABC, $(a + b + c)(b + c - a) = \lambda bc$ if

A. $\lambda < 0$

B. $\lambda > 4$

C. $0 < \lambda < 4$

D. $\lambda > 6$

Answer: C

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13. In a ΔABC, if $a:b:c=4:5:6$, then the ratio of the radius of the circumcircle to that of the incircle is

A. $7:5$

B. $9:5$

C. $12:7$

D. $16:7$

Answer: D

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14. A circle is inscribed in an equilateral triangle of side a, The area of the square inscribed in the circle,in sq.units is

A. $a^2/8$

B. $a^2/6$

C. $a^2/4$

D. $a^2/2$

Answer: B

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15. In a ΔABC, if p,q,r are the distances from the orthocentre to the vertices A,B,C respectively, then a q r + b r p+ c p q =

A. p q r

B. a b c

C. 3r

D. 3(p+q+r)

Answer: B

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16. A regular polygon of nine sides, each of length 2 is inscribed in a circle. The radius of the circle is

A. $\cos ec\frac{\pi}{9}$

B. $2\cos ec\frac{\pi}{9}$

C. $\sec\frac{\pi}{9}$

D. $\cot\frac{\pi}{9}$

Answer: A

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17. IF an equilateral triangle and a regular hexagon have the same perimeter, then the ratio of their areas is

A. $1:4$

B. $1:3$

C. $2:3$

D. $2:5$

Answer: C

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EXERCISE 1A

1. In ΔABC, if a=5 ,b=6, sin $A = 5/6$,then B=

A. π

B. $\pi/2$

C. $\pi/3$

D. $\pi/4$

Answer: B

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2. In ΔABC, if $A = 75^\circ, B = 45^\circ, c = \sqrt{3}$, then b=

A. 2

B. $\sqrt{3}$

C. $2\sqrt{3}$

D. $\sqrt{2}$

Answer: D

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3. In ΔABC, if $a = \sqrt{3} + 1, b = 2, B = 45^\circ$, then A=

A. 30°

B. 60°

C. 75°

D. 45°

Answer: C

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4. In ΔABC, if $a = \sqrt{3} + 1, B = 30^\circ, C = 45^\circ$, then c=

A. 2

B. 3

C. 4

D. 1

Answer: A

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5. In ΔABC, if $A = 30^\circ, b = 8, a = 6, B = \sin^{-1} x$, then x=

A. $1/2$

B. $1/3$

C. $2/3$

D. 1

Answer: C

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6. In ΔABC, if A=10, R=5 then A=

A. π

B. $\pi/2$

C. $\pi/3$

D. $\pi/4$

Answer: B

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7. If a =2 , b = 3 c=4 then find cos A .

A. $7/8$

B. $5/7$

C. $6/7$

D. $5/8$

Answer: A

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8. In $\Delta ABC, \quad \text{if} \quad a=4, b=5, c=60^{\circ}$, then c=

A. $2\sqrt{3}$

B. $\sqrt{21}$

C. 8

D. 14

Answer: B

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9. In ΔABC if $b = 20, c = 21$ and $\sin A = 3/5$, then a=

A. 12

B. 13

C. 14

D. 15

Answer: B

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10. In ΔABC, if a=4 cm,b=5 cm,c=7 cm, then $\cos \frac{A}{2}$=

A. $1/\sqrt{5}$

B. $1/\sqrt{2}$

C. $\sqrt{32/35}$

D. $2/3$

Answer: C

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11. In ΔABC, if a=4 cm,b=7 cm,c=9 cm, then $\tan\frac{A}{2}$=

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

B. $1/\sqrt{20}$

C. $\sqrt{20}$

D. $2/3$

Answer: B

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12. In ΔABC, if a=13 cm, b=12 cm,c=5 cm, then $\sin\frac{A}{2}=$

A. $1/\sqrt{5}$

B. $1/\sqrt{2}$

C. $\sqrt{32/35}$

D. $2/3$

Answer: B

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13. In $\Delta ABC, \quad \text{if} \quad a=3cm, b=4cm, c=5cm, then \cos\frac{C}{2}=$

A. $1/\sqrt{5}$

B. $1/\sqrt{2}$

C. $\sqrt{32/35}$

D. $2/3$

Answer: B

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14. In $\Delta ABC, \quad \text{if} \quad a = 13cm, b = 14cm, c = 15cm,$ then $\tan\frac{C}{2} =$

A. $1/\sqrt{5}$

B. $1/\sqrt{2}$

C. $\sqrt{32/35}$

D. $2/3$

Answer: D

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15. In $\Delta ABC, \quad \text{if} \quad a = 7, b = 7\sqrt{3}$ and right angled at C, then c=

A. $2/\sqrt{3}$

B. $\sqrt{21}$

C. 8

D. 14

Answer: D

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16. If the angles of a triangle are in A.P,a=2, c=4 then b=

A. $2/\sqrt{3}$

B. $\sqrt{21}$

C. 8

D. 14

Answer: A

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17. The lengths of the two larger sides of a triangle are 10 and 9. If the angles are in A.P, then the length of the third side can be

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

B. $3\sqrt{3}$

C. 5

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

Answer: A

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18. If the angles of a triangle are $30^\circ, 45^\circ$ and the included side is $\sqrt{3} + 1$, then the remaining sides are

A. $2, \sqrt{2}$

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

C. $\sqrt{2}, 4$

D. $2, 4\sqrt{3}$

Answer: A

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19. If two angles of a $\Delta ABCare45^\circ \text{ and } 60^\circ$, then the ratio of the smallest and the greatest sides are

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

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

C. $1:\sqrt{3}$

D. $\sqrt{3}:1$

Answer: A

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20. 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 the triangle is

A. equilateral

B. right angled

C. obtuse angled

D. none

Answer: C

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21. IF 4,5 are two sides of a triangle and the included angle is 60°, then its area is

A. 3

B. 5

C. $5\sqrt{3}$

D. $3\sqrt{3}$

Answer: C

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22. IF 13,14,15 are the sides of the triangle , then the area of the triangle in sq. unit is

A. 84

B. 72

C. 56

D. 68

Answer: A

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23. In ΔABC, if $a = 2, B = 120^\circ, C = 30^\circ$, then the area of the triangle is

A. $2\sqrt{3}$

B. $\sqrt{3}$

C. $\sqrt{3}/2$

D. $4\sqrt{3}$

Answer: B

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24. In ΔABC, 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^2b^2

Answer: D

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25. In ΔABC, if $a = 4, b = 3 \angle A = 60^\circ$, 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: A

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

A. $8/3$

B. $16/3$

C. $32/3\sqrt{3}$

D. $64/3$

Answer: C

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27. If two sides of a triangle are the roots of the equation $4x^2 - \left(2\sqrt{6}\right)x + 1 = 0$ and the included angle is 60°, then the third side is

A. $\sqrt{3}$

B. $\sqrt{3}/2$

C. $1/\sqrt{3}$

D. $2/\sqrt{3}$

Answer: B

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28. The straight roads intersect at angle of 60°. A bus on one road is 2km. Away from the intersection and a car on the 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: D

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29. In $\Delta ABC, \quad \text{if} \quad a = 5, A = 30^\circ$, then the circumradius is

A. 4

B. 3

C. 6

D. 5

Answer: D

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30. If the length of each side of an equilateral triangle is 10 cm, then its circumradius is

A. $10\sqrt{3}$

B. $3\sqrt{10}$

C. $3/\sqrt{10}$

D. $10/\sqrt{3}$

Answer: D

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31. The diameter of the circumcircle of the triangle whose sides 61,60,11 is

A. 61

B. 60

C. 11

D. 50

Answer: A

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32. IF the sides of a triangle ABC are 6,8,10 unit , then the radius of its circumcentre is

A. 4

B. 3

C. 6

D. 5

Answer: D

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33. IF the perimeter of a triangle is 12 times the arithmetic mean of the sides of its angles then its circumference=

A. 1

B. 2

C. 3

D. 6

Answer: B

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34. In $\Delta ABC, \quad \text{if} \quad b = c = R$ then A=

A. 30°

B. 60°

C. 90°

D. 120°

Answer: D

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35. IF the area of the triangle ABC is $a^2 - (b-c)^2$, then its circumradius R=

A. $(a/6)\sin^2(A/2)$

B. $(a/16)\cos ec^2(A/2)$

C. $(b/16)\sin^2(B/2)$

D. $(c/16)\sin^2(C/2)$

Answer: B

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36. If $\Delta = a^2 - (b-c)^2$, is the area of the triangle ABC, then tan A=

A. $\frac{1}{16}$

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

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

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

Answer: B

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37. IF the sides of a triangle are $7, 4\sqrt{3}, \sqrt{13}$ then its smallest angle is

A. 30°

B. 45°

C. 90°

D. $120\circ$

Answer: A

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38. In ΔABC, if $\cot\frac{A}{2} : \cot\frac{B}{2} : \cot\frac{C}{2} = 1:4:15$, then the greatest angle of the triangle is

A. $\pi/3$

B. $\pi/4$

C. $\pi/6$

D. $2\pi/3$

Answer: D

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39. IF $x^2+x+1, 2x+1, x^2-1$ are the sides of a triangle then its largest angle is

A. $\pi/3$

B. $\pi/4$

C. $\pi/6$

D. $2\pi/3$

Answer: D

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40. If the sides of a triangle are in the ratio $x : y : \sqrt{x^2 + xy + y^2}$, then the greatest angle is

A. 90°

B. 120°

C. $\cos^{-1}\left(\frac{x+y}{x-y}\right)$

D. none

Answer: B

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41. The sides of a 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. 60°

B. 150°

C. 120°

D. 90°

Answer: C

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42. The smallest angle of the triangle whose sides are $6+\sqrt{12}, \sqrt{48}, \sqrt{24}$ is

A. $\pi/3$

B. $\pi/4$

C. $\pi/6$

D. $2\pi/3$

Answer: C

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43. IF the angles of a triangle are in the ratio $2:3:5$, then the ratio of the greatest side to the least side is

A. $2:\sqrt{10-2\sqrt{5}}$

B. $4:\sqrt{10-2\sqrt{5}}$

C. $2:\sqrt{10+2\sqrt{5}}$

D. $4:\sqrt{10+2\sqrt{5}}$

Answer: B

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44. If the angles of a right angled triangle are in A.P then the sides are in the ratio

A. $1:3:2$

B. $1:2:1$

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

D. none

Answer: C

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45. 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

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46. If the angles of a triangle are in the ratio $1:2:7$, then the ratio of the longest side to the smallest side is

A. $1:7$

B. $1:3$

C. $\sqrt{5}+1:\sqrt{5}-1$

D. $\sqrt{5}-1:\sqrt{5}+1$

Answer: C

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47. The angles of a triangle are in the ratio $3:5:10$. Then 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

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48. IF the angles of triangle are in the ratio $1:1:4$ then the ratio of the perimeter of the triangle to its largest side is

A. $3:2$

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

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

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

Answer: C

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49. In $\Delta ABC, \quad \text{if} \quad \sin^2 A + \sin^2 B = \sin^2 C$, then C=

A. 30°

B. 45°

C. 60°

D. 90°

Answer: D

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50. In ΔABC, $\sin A : \sin B : \sin C$ is

A. a+b+c

B. $a : b : c$

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

D. abc

Answer: B

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51. The sides of a right angled triangle are in A.P then they are in the ratio

A. $2:3:1$

B. $2:3:5$

C. $3:4:5$

D. $3:1:2$

Answer: C

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52. The circumcentre of a triangle lies with in the triangle only when the triangle is

A. acute angled

B. right angled

C. isosceles

D. none of these

Answer: A

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53. In $\Delta ABC, \quad \text{if} \quad \cos^2 A + \cos^2 B + \cos^2 C = 1$, then the triangle is

A. equilateral

B. right angled

C. isosceles

D. none of these

Answer: B

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54. In $\Delta ABC, \quad \text{if} \quad \cos A + \cos B + \cos C = 3/2$, then the triangle is

A. isosceles

B. equilateral

C. right angled

D. none of these

Answer: B

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55. In $\Delta ABC, \quad \text{if} \quad \tan A + \tan B + \tan C = 3\sqrt{3}$, then the triangle is

A. isosceles

B. right angled

C. equilateral

D. none

Answer: C

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56. In ΔABC, if $\tan B \tan C + \tan C \tan A + \tan A \tan B = \sqrt{3} \tan A \tan B$ then the triangle is

A. isosceles

B. equilateral

C. right angled

D. right angled isosceles

Answer: A

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57. In ΔABC, if $c(a+b)\cos B/2 = b(a+c)\cos C/2$, then the triangle is

A. isosceles

B. right angled

C. equilateral

D. none of these

Answer: A

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58. In ΔABC, if $a^2+b^2+c^2 = 8R^2$, then the triangle is

A. right angled

B. isosceles

C. equilateral

D. none of these

Answer: A

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59. In ΔABC, if $\sin^2 A + \sin^2 B + \sin^2 C = 9/4$, then the triangle is

A. isosceles

B. right angled

C. equilateral

D. none of these

Answer: C

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60. In ΔABC, if $\cos^2 A + \cos^2 B + \cos^2 C = 3/4$, then the triangle is

A. right angled

B. equilateral

C. isosceles

D. none

Answer: B

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61. IF $\Delta ABC, \quad \text{if} \quad a\tan A + b\tan B = (a+b)\tan\left(\frac{A+B}{2}\right)$, then the triangle is

A. isosceles

B. right angled

C. equilateral

D. none

Answer: A

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62. IF $\Delta ABC, \quad \text{if} \quad \cot\frac{A}{2} = \frac{b+c}{a}$, then the triangle is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: C

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63. In a triangle ABC if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$, then ΔABC is

A. right angled

B. Isosceles right angled

C. equilateral

D. Scalene

Answer: C

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64. IF $\cos A = \frac{\sin B}{2\sin C}$, then ΔABC is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: A

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65. In a triangle ABC if sin A sin B=ab/c^2, then the triangle is

A. equilateral

B. right angled

C. obtuse angled

D. none

Answer: B

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66. In $\Delta ABC, \quad \text{if} \quad \sin C = \frac{\sin A}{2\cos B}$ then the triangle is

A. equilateral

B. right angled

C. isosceles

D. none

Answer: C

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67. In $\Delta ABC, \quad \text{if} \quad 2\cos B = a/c$, then the triangle is

A. right angled

B. equilateral

C. isosceles

D. none

Answer: C

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68. IF $a\cos B = b\cos A$, then ΔABC is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: A

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69. In ΔABC if $a^2 + b^2 + c^2 = ca + ab\sqrt{3}$ then the triangle is

A. equilateral

B. right angled isosceles

C. right angled with $A = 90^\circ, B = 60^\circ, C = 30^\circ$

D. None

Answer: C

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70. In ΔABC, if $\cos A \cos B + \sin A \sin B \sin C = 1$, then the triangle is

A. equilateral

B. right angled

C. isosceles

D. right angled isosceles

Answer: D

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71. In ΔABC, if $\cos A \cos B + \sin A \sin B \sin C = 1$, then $a : b : c =$

A. $1 : 1 : 1$

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

C. $1 : 1 : 2$

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

Answer: D

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72. In ΔABC, if $\sin A \cos B = 1/4$ and $3\tan A = \tan B$, the triangle is right angled at

A. A

B. B

C. C

D. not right angled

Answer: C

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73. In a triangle ABC if $\cot A = \left(x^3 + x^2 + x\right)^{1/2}$, $\cot B = \left(x + x^{-1} + 1\right)^{1/2}$ and $\cot C = \left(x^{-3} + x^{-2} + x^{-1}\right)^{-1/2}$ then the triangle is

A. isosceles

B. obtuse angled

C. right angled

D. none

Answer: C

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74. The radius of the circumcircle of an isosceles triangle PQR is equal to $PQ(=PR)$. Then the angle P is

A. $\pi/6$

B. $\pi/3$

C. $\pi/2$

D. $2\pi/3$

Answer: D

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75. The perimeter of a ΔABC is 6 times the A.M. of the sines of its angles. If the side 'a' is 1, then the angle A is

A. $\pi/6$

B. $\pi/3$

C. $\pi/2$

D. π

Answer: A

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76. If $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$, then the ΔABC is

A. right angled

B. obtuse angled

C. isosceles

D. equilateral

Answer: B

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77. In ΔABC, if $(\sin A + \sin B + \sin C)(\sin A + \sin B - \sin C) = 3 \sin A \sin$, then

A. $A = 60^\circ$

B. $B = 60^\circ$

C. $C = 60^\circ$

D. None

Answer: C

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78. In ΔABC, if $\sin A + \sin B + \sin C = 1 + \sqrt{2}$ and $\cos A + \cos B + \cos C = \sqrt{2}$ then the triangle is

A. equilateral

B. isosceles

C. right angled

D. right angled isosceles

Answer: D

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79. IF ABC is the triangle then one root of $x^2 - 2bx\cos A + b^2 - a^2 = 0$ is

A. a

B. b

C. C

D. none

Answer: C

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80. In $\Delta ABC \sum \frac{\sin^2 A + \sin A + 1}{\sin A}$ is always greater than

A. 9

B. 3

C. 27

D. none

Answer: A

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81. In $\Delta ABC \prod \left(\frac{\sin^2 A + \sin A + 1}{\sin A} \right)$ is always greater than

A. 9

B. 3

C. 27

D. none

Answer: C

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82. If A, B,C are angles of a acute angled triangle then the least value of tan A tan B tan C is

A. 1

B. 3

C. $\sqrt{3}$

D. $3\sqrt{3}$

Answer: D

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83. In a right angled ΔABC, $\sin^2 A + \sin^2 B + \sin^2 C$=

A. 0

B. 1

C. -1

D. 2

Answer: D

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84. IF twice the square of the radius of a circle is equal to half the sum of the squares of the sides of inscribed triangle ABC, then $\sin^2 A + \sin^2 B + \sin^2 C =$

A. 1

B. 2

C. 4

D. 8

Answer: A

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85. In a triangle ABC,if a is the arithemetic mean and b,c $(b \neq c)$are the two geometric means between any two positive real number then $\frac{\sin^3 B + \sin^3 C}{\sin A \sin b \sin C}$=

A. 0

B. 1

C. 2

D. 4

Answer: C

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86. Points D,E are taken on the side BC of a triangle ABC, such that BD=DE=EC. IF $\angle BAD = x, \angle DAE = y, \angle EAC = z$, then the value of $\frac{\sin(x+y)\sin(y+z)}{\sin x \sin z}$=

A. 1

B. 2

C. 4

D. None

Answer: C

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87. In ΔABC, if $B = 60^\circ, C = 45^\circ$ and D divides BC internally in the ratio $1:3$ then $\frac{\sin\angle BAD}{\sin\angle CAD}$=

A. $1/\sqrt{6}$

B. $1/3$

C. $1/\sqrt{3}$

D. $\sqrt{2}/\sqrt{3}$

Answer: A

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88. If the area of an isosceles triangle is $\sqrt{2}+1$are vertical angle is 45° then the base of the triangle is

A. 1

B. 2

C. $\sqrt{2}$

D. $\sqrt{2}-1$

Answer: B

Watch Video Solution

89. IF A,B,C are angles of a triangle, then the minimum value of $\tan^2\frac{A}{2}+\tan^2\frac{B}{2}+\tan^2\frac{C}{2}$ is

A. 0

B. 1

C. $1/2$

D. None

Answer: B

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90. In ΔABC, $\sum a(\sin B-\sin C)=$

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

91. In ΔABC, $\sum a^2\left(\cos^2 B - \cos^2 C\right)$=

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

92. In ΔABC, $\sum a.\sin(B-C)$=

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

93. In a triangle ABC, $C=90^\circ$. Then $\frac{a^2-b^2}{a^2+b^2}$=

A. sin (A+B)

B. sin (A-B)

C. cos (A+B)

D. cos (A-B)

Answer: B

Watch Video Solution

94. In any ΔABC, $\frac{(a+b+c)(b+c-a)(c+a-b)(a+b-c)}{4b^2c^2}$=

A. $\cos^2 A$

B. $\cos^2 B$

C. $\sin^2 A$

D. $\sin^2 B$

Answer: C

Watch Video Solution

95. In ΔABC, $\sum a^3 \sin(B-C)$=

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

96. In ΔABC, $\sum a^3 \sin(B-C)$=

A. 0

B. abc

C. 3abc

D. 1

Answer: C

Watch Video Solution

97. In a triangle ABC, $(a^2 - b^2 - c^2)\tan A + (a^2 - b^2 + c^2)\tan B$ is equal to

A. $(a^2 + b^2 + c^2)\tan C$

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

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

D. None

Answer: D

Watch Video Solution

98. In ΔABC, $\frac{\sin A(a - b\cos C)}{\sin C(c - b\cos A)} =$

A. -2

B. -1

C. 0

D. 1

Answer: D

Watch Video Solution

99. In ΔABC, $\frac{b - a\cos C}{c - a\cos B} =$

A. c

B. c/b

C. bc

D. b-c

Answer: B

Watch Video Solution

100. In ΔABC, $\frac{\cos C + \cos A}{c + a} + \frac{\cos B}{b} =$

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

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

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

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

Answer: B

Watch Video Solution

101. In a triangle ABC, $\frac{a(a+c-b)}{b(b+c-a)}$ is equal to

A. $\frac{1-\cos A}{1-\cos B}$

B. $\frac{1+\cos A}{1+\cos B}$

C. $\frac{\cos^2(A/2)}{\sin^2(B/2)}$

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

Answer: A

Watch Video Solution

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

A. a

B. b

C. c

D. a+b+c

Answer: A

Watch Video Solution

103. In ΔABC, $(b+c-a)\tan(A/2)$=

A. Δ

B. 2Δ

C. $2\Delta/s$

D. none

Answer: C

Watch Video Solution

104. In ΔABC, if $s = 2b$ then $\cot\frac{A}{2}\cot\frac{C}{2}$=

A. 2

B. 1

C. 3

D. $\sqrt{2}$

Answer: A

Watch Video Solution

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

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

106. In ΔABC, if a,b,c are in A.P, then $\cos\left(\frac{A-C}{2}\right)\cos ec\left(\frac{B}{2}\right) =$

A. $1/2$

B. 2

C. $1/3$

D. 3

Answer: B

Watch Video Solution

107. In ΔABC, $a(b\cos C - c\cos B) =$

A. b-c

B. b+c

C. $b^2 - c^2$

D. $b^2 + c^2$

Answer: C

Watch Video Solution

108. In a triangle ABC, $\frac{\cos B + \cos C}{1 - \cos A}$=

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

B. $\frac{bc}{1 - a}$

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

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

Answer: C

Watch Video Solution

109. In ΔABC, $b\cos(C+\theta)+c\cos(B-\theta)=$

A. $a\sin\theta$

B. $a\cos\theta$

C. $a\tan\theta$

D. $a\cot\theta$

Answer: B

Watch Video Solution

110. In ΔABC, $\frac{b-c}{b+c}\cot\frac{A}{2}+\frac{b+c}{b-c}\tan\frac{A}{2}=$

A. $2\sin(B-C)$

B. $2\cos ec(B-C)$

C. $2\cos(B-C)$

D. $2\cot(B-C)$

Answer: B

Watch Video Solution

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

A. a

B. b

C. c

D. 0

Answer: D

Watch Video Solution

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

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

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

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

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

Answer: A

Watch Video Solution

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

A. c

B. $c/2$

C. 2c

D. 3c

Answer: C

Watch Video Solution

114. In ΔABC, $(a-b)^2 \cos^2 \frac{C}{2} + (a+b)^2 \sin^2 \frac{C}{2} =$

A. c

B. $c/2$

C. 2c

D. c^2

Answer: D

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115. Two sides of a triangle are given by the roots of the equation $x^2 - 5x + 6 = 0$ and the angle between the sides is $\pi/2$. Then the perimeter of the triangle is

A. $5+\sqrt{2}$

B. $5+\sqrt{13}$

C. $5+\sqrt{5}$

D. $5+\sqrt{7}$

Answer: D

Watch Video Solution

116. In ΔABC, $\frac{bc\cos A+ca\cos B+ab\cos C}{\cot A+\cot B+\cot C}=$

A. Δ

B. 2Δ

C. $\frac{1}{2}\Delta$

D. Δ^2

Answer: B

Watch Video Solution

117. In ΔABC, $\frac{\cot(A/2)+\cot(B/2)+\cot(C/2)}{\cot A+\cot B+\cot C}=$

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. Δ

Answer: A

Watch Video Solution

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

A. 1

B. 0

C. s

D. 2Δ

Answer: B

Watch Video Solution

119. In ΔABC, $a^2 \sin 2C + c^2 \sin 2A =$

A. Δ

B. 2Δ

C. 3Δ

D. 4Δ

Answer: D

Watch Video Solution

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

A. Δ

B. 2Δ

C. 3Δ

D. 4Δ

Answer: C

Watch Video Solution

121. In ΔABC, if A,B,C are in A.P then $\frac{a+c}{\sqrt{a^2-ac+c^2}} =$

A. $\cos\left(\frac{A-C}{2}\right)$

B. $\sin\left(\frac{A-C}{2}\right)$

C. $2\cos\left(\frac{A-C}{2}\right)$

D. $2\sin\left(\frac{A-C}{2}\right)$

Answer: C

Watch Video Solution

122. In ΔABC, if a,b,c are in A.P the greatest angle is A and least is C then $4(1-\cos A)(1-\cos C)$=

A. cos A+cos C

B. cos A- cos C

C. sin A+sin C

D. cos A- sin C

Answer: A

Watch Video Solution

123. In ΔABC, if $x=\tan\left(\frac{B-c}{2}\right)\tan\frac{A}{2}, y=\tan\left(\frac{C-A}{2}\right)\tan\frac{B}{2}, z=\tan\left(\frac{A-B}{2}\right)\tan$, then x+y+z (In terms of x,y,z only) is

A. xyz

B. 2xyz

C. $-xyz$

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

Answer: C

Watch Video Solution

124. In ΔABC, if cos A+2 cos B+cos C=2, then the sides of the triangle are in

A. H.P.

B. G.P.

C. A.P.

D. None

Answer: C

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125. In ΔABC, if $a\sin^2\frac{C}{2}+c\sin^2\frac{A}{2}$ in terms of s,a,b,c is

A. s

B. (s-b)

C. a/c

D. 0

Answer: B

Watch Video Solution

126. In ΔABC, if $c\cos^2\frac{A}{2}+a\cos^2\frac{C}{2}$ in terms of s is

A. s

B. (s-b)

C. a/c

D. 0

Answer: A

Watch Video Solution

127. In ΔABC, $(b-c)^2 + 4bc\sin^2(A/2) =$

A. a^2

B. b^2

C. c^2

D. None

Answer: A

Watch Video Solution

128. In ΔABC, if $b = (c+a)\cos\theta$, then $\sin\theta$=

A. $\frac{2\sqrt{bc}}{b+c}\cos\frac{A}{2}$

B. $\frac{2\sqrt{ca}}{c+a}\cos\frac{B}{2}$

C. $\frac{2\sqrt{ab}}{a-b}\sin\frac{C}{2}$

D. $\frac{2\sqrt{bc}}{b-c}\sin\frac{A}{2}$

Answer: B

Watch Video Solution

129. In ΔABC, if $c=(a-b)\sec\theta$, then $\tan\theta=$

A. $\frac{2\sqrt{bc}}{b+c}\cos\frac{A}{2}$

B. $\frac{2\sqrt{ca}}{c+a}\cos\frac{B}{2}$

C. $\frac{2\sqrt{ab}}{a-b}\sin\frac{C}{2}$

D. $\frac{2\sqrt{bc}}{b-c}\sin\frac{A}{2}$

Answer: C

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130. In ΔABC, if $c=(a+b)\sin\theta$ and $\cos\theta=\frac{k\sqrt{ab}}{a-b}$, then the vaue of k is

A. $2\cos(C/2)$

B. $2\cos(B/2)$

C. $2\cos(A/2)$

D. None

Answer: A

Watch Video Solution

131. In ΔABC, if $a(b\cos C+c\cos B)=2ka^2$, then k =

A. 0

B. 1

C. $1/2$

D. 2

Answer: C

Watch Video Solution

132. In ΔABC, if $\tan\theta = \frac{a+b}{a-b}\tan\frac{C}{2}$, then c=

A. $(a-b)\cos\frac{C}{2}\sec\theta$

B. $(a+b)\cos\frac{C}{2}\sec\theta$

C. $(a-b)\sin\frac{C}{2}\tan\theta$

D. $(a+b)\sin\frac{C}{2}\tan\theta$

Answer: A

View Text Solution

133. If $\tan.\frac{C-A}{2} = k\cot.\frac{B}{2}$ then find k .

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

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

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

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

Answer: A

Watch Video Solution

134. In ΔABC, if $\tan\frac{A}{2} = t\cot\left(\frac{B-C}{2}\right)$, then t=

A. $(c-a)(c+a)$

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

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

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

Answer: C

Watch Video Solution

135. If the area of a triangle satisfies the relation $\Delta = a^2 - (b-c)^2$, then $\tan(A/2)$=

A. $1/4$

B. $1/3$

C. $1/2$

D. None

Answer: A

Watch Video Solution

136. In ΔABC, if 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. None

Answer: B

Watch Video Solution

137. In ΔABC, if $\tan\frac{A}{2}, \tan\frac{B}{2}, \tan\frac{C}{2}$ are in H.P, then a,b,c are in

A. H.P.

B. G.P.

C. A.P.

D. None

Answer: C

Watch Video Solution

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

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

Watch Video Solution

139. In $\Delta ABC, \quad \text{if} \quad \cot\frac{A}{2}, \cot\frac{B}{2}, \cot\frac{C}{2}$ are in A.P. then a,b,c are In

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

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140. In ΔABC, if $\sin^2\frac{A}{2}, \sin^2\frac{B}{2}, \sin^2\frac{C}{2}$ are in H.P, then a,b,c in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: C

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141. In ΔABC, if $a\cos^2\frac{C}{2} + c\cos^2\frac{A}{2} = \frac{3b}{2}$ then a,b,c are in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

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142. In ΔABC, if $\tan\frac{A}{2}=\frac{5}{6}, \tan\frac{C}{2}=\frac{2}{5}$ then

A. a,c,b are in A.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

143. If $\tan.\frac{A}{2}=\frac{5}{6}$ and $\tan.\frac{C}{2}=\frac{2}{5}$ then determine the relation between a, b,c

A. $b^2 = ac$

B. $2b = a + c$

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

D. $a + b = c$

Answer: B

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144. In ΔABC, if $3\tan\frac{A}{2}\tan\frac{C}{2} = 1$ then a,b,c are in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

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145. In ΔABC, if tan A, tan B, tan C are in H.P., then a^2, b^2, c^2 are in

A. H.P.

B. G.P.

C. A.P.

D. None

Answer: C

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

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

Watch Video Solution

147. 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

Answer: A

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148. In ΔABC, if $\frac{a+b}{1-ab}b, \frac{b+c}{1-bc}$ are in A.P then $a, 1/b, c$ are In

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: C

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149. In ΔABC, if $C = A - B = 60^\circ$, then the value of $\frac{a-b}{c} =$

A. $1/\sqrt{3}$

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

150. In $\Delta ABC, \quad \text{if} \quad A = 60^\circ$ then $\frac{b}{c+a} + \frac{c}{a+b} =$

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

151. If $C = 60^\circ, \quad \text{then show that} \frac{a}{b+c} + \frac{b}{c+a} = 1$

A. 2

B. 4

C. 3

D. 1

Answer: D

Watch Video Solution

152. In ΔABC, if $C = 60^\circ$ then $\frac{1}{a+b} + \frac{1}{a+c}$=

A. a+b+c

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

C. abc

D. 0

Answer: B

View Text Solution

153. In ΔABC, if $C = 60^\circ$ 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: D

View Text Solution

154. In ΔABC, if $\frac{a}{b^2 - c^2} + \frac{c}{b^2 - a^2} = 0$ then B=

A. $\pi / 2$

B. $\pi / 4$

C. $2\pi / 3$

D. $\pi / 3$

Answer: D

Watch Video Solution

155. In ΔABC, if $B = 90^\circ$ then $\tan\frac{A}{2} =$

A. $\sqrt{\frac{b-c}{b+c}}$

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

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

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

Answer: A

Watch Video Solution

156. In ΔABC, if $C = 90^\circ$ then $\frac{a^2+b^2}{a^2-b^2}\sin(A-B)$=

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

157. In ΔABC if $\frac{1}{b+c}+\frac{1}{c+a}=\frac{3}{a+b+c}$ then C=

A. 90°

B. 60°

C. 45°

D. 30°

Answer: B

Watch Video Solution

158. In ΔABC, if $(a+b+c)(a+b-c)=3ab$, then C=

A. 60°

B. 30°

C. 90°

D. None

Answer: A

Watch Video Solution

159. In ΔABC if $A=60^\circ$, then the value of $\left(1+\frac{a}{c}+\frac{b}{c}\right)\left(1+\frac{c}{b}-\frac{a}{b}\right)$=

A. 3

B. 2

C. 1

D. None

Answer: A

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160. In ΔABC, $\frac{\cos A}{c \sin B} + \frac{\cos B}{a \sin C} + \frac{\cos C}{b \sin A} =$

A. s

B. R

C. $1/R$

D. $1/\Delta$

Answer: C

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161. In ΔABC, if $\frac{\sin A}{4} = \frac{\sin B}{5} = \frac{\sin C}{6}$ then the value of cos A +cos B +cos C =

A. $23/15$

B. $23/16$

C. $23/14$

D. None

Answer: B

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162. In ΔABC, if $a:b:c=3:4:5$, then $\sin A:\sin B:\sin C=$

A. $3:4:5$

B. $9:16:25$

C. $9:8:7$

D. $7:9:8$

Answer: A

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163. In a $\triangle ABC$, if $a:b:c=7:8:9$, then find $\cos A:\cos B:\cos C$.

A. $7:9:11$

B. $14:11:6$

C. $7:19:25$

D. $8:6:5$

Answer: B

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164. In ΔABC if $b+c:c+a:a+b=11:12:13$, then $\cos A:\cos B:\cos C$=

A. $7:9:11$

B. $14:11:6$

C. $7:19:25$

D. $8:6:5$

Answer: C

Watch Video Solution

165. In ΔABC, if $\cos A = 17/22, \cos C = 1/14$, then $a:b:c =$

A. $7:9:11$

B. $14:11:6$

C. $7:19:25$

D. $8:6:5$

Answer: A

Watch Video Solution

166. In ΔABC, if $\cot\frac{A}{2}:\cot\frac{B}{2}:\cot\frac{C}{2} = 3:7:9$, then $a:b:c =$

A. $7:9:11$

B. $14:11:6$

C. $7:19:25$

D. $8:6:5$

Answer: D

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167. In ΔABC, if $\tan A:\tan B:\tan C=1:2:3$, then $\sin A:\sin B:\sin C=$

A. $\sqrt{5}:3:2\sqrt{2}$

B. $3:2\sqrt{2}:\sqrt{5}$

C. $\sqrt{5}:2\sqrt{2}:3$

D. None

Answer: C

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168. In a triangle ABC, $\frac{s-a}{11} = \frac{s-b}{12} = \frac{s-c}{13}$, then $\tan^2(A/2) =$

A. $143/432$

B. $13/33$

C. $11/39$

D. $12/37$

Answer: B

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169. In a triangle ABC, if $\cot\frac{A}{2}\cot\frac{B}{2} = c$, $\cot\frac{B}{2}\cot\frac{C}{2} = a$ and $\cot\frac{C}{2}\cot\frac{A}{2} = b$, then $\frac{1}{s-a} + \frac{1}{s-b} + \frac{1}{s-c} =$

A. -1

B. 0

C. 1

D. 2

Answer: D

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170. In $\Delta ABC, B = 45^\circ, C = 120^\circ, a = 40cm,$ the length of the perpendicular from A on BC produced is

A. $40\left(\sqrt{3}+1\right)$

B. $20\left(\sqrt{3}+1\right)$

C. $40\left(3+\sqrt{3}\right)$

D. $20\left(3+\sqrt{3}\right)$

Answer: D

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171. If H is the orthocentre of ΔABC, then AH=

A. cos A

B. R cos A

C. 2 R cos A

D. None

Answer: C

View Text Solution

172. IF H is the orthocentre of ΔABC and if AH=x, BH=y, CH=z, then $\frac{a}{x}+\frac{b}{y}+\frac{c}{z}=$

A. $\frac{a}{x}\frac{b}{y}\frac{c}{z}$

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

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

D. abc

Answer: A

Watch Video Solution

173. In ΔABC, if $\frac{2\cos A}{a}+\frac{\cos B}{b}+\frac{2\cos C}{c}=\frac{a}{bc}+\frac{b}{ca}$, then A=

A. 45°

B. 60°

C. 30°

D. 90°

Answer: D

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174. If α, β, γ are the lengths of altitudes of ΔABC, then $\alpha^{-2}+\beta^{-2}+\gamma^{-2}$=

A. Δ

B. $\cot A + \cot B + \cot C$

C. $\dfrac{\cot A + \cot B + \cot C}{\Delta}$

D. $\dfrac{\Delta}{\cot A + \cot B + \cot C}$

Answer: C

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175. If α, β, γ, are lengths of the altitudes of a triangle ABC with area Δ, then $\dfrac{\Delta^2}{R^2}\left(\dfrac{1}{\alpha^2} + \dfrac{1}{\beta^2} + \dfrac{1}{\gamma^2}\right) =$

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

B. $\cos^2 A + \cos^2 B + \cos^2 C$

C. $\tan^2 A + \tan^2 B + \tan^2 C$

D. $\cot^2 A + \cot^2 B + \cot^2 C$

Answer: A

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176. If α, β, γ are the lengths of the altitudes of ΔABC, then $\frac{\cos A}{\alpha} + \frac{\cos B}{\beta} + \frac{\cos C}{\gamma} =$

A. Δ

B. $1/\Delta$

C. R

D. $1/R$

Answer: D

Watch Video Solution

177. IF α, β, γ are the lengths of the altitudes of ΔABC, then $\frac{1}{\alpha} + \frac{1}{\beta} - \frac{1}{\gamma} - \frac{2ab}{(a+b+c)\Delta}\cos^2\frac{C}{2} =$

A. 0

B. 1

C. 2s

D. Δ

Answer: A

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EXERCISE 1B

1. If the sides of the triangle are 13,14,15 then the radius of the incircle is

A. $65/8$

B. $65/4$

C. 4

D. 24

Answer: C

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2. In ΔABC, if $r : R : r_1 = 2 : 5 : 12$, then A=

A. 45°

B. 60°

C. 30°

D. 90°

Answer: D

Watch Video Solution

3. In ΔABC, if $a = 26, b = 30, \cos C = 63/65$ then r=

A. 3

B. 4

C. 5

D. 2

Answer: A

Watch Video Solution

4. In $\Delta ABC, \quad \text{if} \quad a = 30, b = 24, c = 18$ then r=

A. 15

B. 18

C. 36

D. 6

Answer: D

Watch Video Solution

5. In $\Delta ABC, \quad \text{if} \quad a = 13, b = 14, c = 15,$ then $r_1 =$

A. $21/2$

B. 14

C. $65/8$

D. 4

Answer: A

Watch Video Solution

6. In $\Delta ABC, \quad \text{if} \quad a = 26b = 30\cos C = 63/65$, then the value of r_1 is

A. $65/4$

B. $4/65$

C. 48

D. 16

Answer: D

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7. In $\Delta ABC, \quad \text{if} \quad a = 13, b = 14, c = 15$ then $r_2 =$

A. $21/2$

B. 14

C. $65/8$

D. 12

Answer: D

Watch Video Solution

8. In $\Delta ABC, \quad \text{if} \quad a = 26, b = 30 \cos C = 63/65$, then the value of r_2 is

A. $65/4$

B. $4/65$

C. 48

D. 16

Answer: C

Watch Video Solution

9. In ΔABC, if $a = 30, b = 24, c = 18$, then $r_3 =$

A. 15

B. 18

C. 36

D. 12

Answer: D

Watch Video Solution

10. In ΔABC, if $r_1 = 36, r_2 = 18, r_3 = 12$, then R=

A. 15

B. 18

C. 24

D. 30

Answer: A

Watch Video Solution

11. In ΔABC, if $r_1 = 8, r_2 = 12, r_3 = 24$, then a=

A. 10

B. 12

C. 16

D. 20

Answer: B

Watch Video Solution

12. IF in a triangle ABC,$r_1 = 2, r_2 = 3 \text{ and } r_3 = 6$ then a=

A. 1

B. 2

C. 3

D. 4

Answer: C

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13. In $\Delta ABC, \quad \text{if} \quad r_1 = 36, r_2 = 18, r_3 = 12$, then b=

A. 15

B. 18

C. 24

D. 30

Answer: C

Watch Video Solution

14. In $\Delta ABC, \quad \text{if} \quad r_1 = 3, r_2 = 10, r_3 = 15$ then c=

A. 5

B. 12

C. 13

D. $13/2$

Answer: C

Watch Video Solution

15. In a triangle ABC, $\frac{s-a}{\Delta} = \frac{1}{8}, \frac{s-b}{\Delta} = \frac{1}{12}, \frac{s-c}{\Delta} = \frac{1}{24}$ then b=

A. 16

B. 20

C. 24

D. 28

Answer: A

Watch Video Solution

16. IF 2,4,6,12 are in radius and exradii of triangle , then its area is

A. 6 sq. unit

B. 24 sq.unit

C. 30 sq.unit

D. 12 sq.unit

Answer: B

Watch Video Solution

17. In an equilateral triangle $r : R : r_1$ is

A. $1 : 1 : 1$

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

C. $1 : 2 : 3$

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

Answer: C

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18. In the area of ΔABC is 96 sq.cm and its perimeter is 16 cm, then its is radius is

A. 10 cm

B. 11 cm

C. 12 cm

D. 13 cm

Answer: C

Watch Video Solution

19. If the perimeter of a triangle is 12 unit and it in radius is 1 unit, then its area is

A. 6 sq. unit

B. 24 sq.unit

C. 30 sq.unit

D. 12 sq.unit

Answer: A

Watch Video Solution

20. IF the area of a triangle is 6 sq.unit and its in radius 2 unit then its perimeter is

A. 1

B. 2

C. 3

D. 6

Answer: D

Watch Video Solution

21. The perimeter of a triangle right angled at C is 70, and the in-radius is 6, then $|a-b| =$

A. 1

B. 2

C. 8

D. 9

Answer: A

Watch Video Solution

22. In ΔABC, if $\Delta = 8sq.\ unit, s = 1.5unit$ then its inradius is

A. $14/3$

B. $21/4$

C. $13/2$

D. $16/3$

Answer: D

Watch Video Solution

23. In ΔABC, if $a = 26, b = 30, \cos C = 63/65$ then $r_1 : r_2 : r_3 =$

A. $4:12:1$

B. $3:4:12$

C. $1:4:12$

D. $4:12:3$

Answer: A

Watch Video Solution

24. In ΔABC, if $a = 30b = 24c = 18$, then the ratio $\frac{1}{r_1} : \frac{1}{r_2} : \frac{1}{r_3} =$

A. $1:2:3$

B. $2:1:3$

C. $3:2:1$

D. $1:3:2$

Answer: A

Watch Video Solution

25. In $\Delta ABC, r =$

A. (s-a) $\tan(B/2)$

B. (s-b) tan $(B/2)$

C. (s-b) tan $(C/2)$

D. (s-a) $\tan(C/2)$

Answer: B

Watch Video Solution

26. In $\Delta ABC, r_1 r_2 r_3 =$

A. 4 R

B. $r.\ s$

C. $r.\ s^2$

D. R

Answer: C

Watch Video Solution

27. In ΔABC, $\frac{\sqrt{rr_1r_2r_3}}{2Rr(\sin A+\sin B+\sin C)}$ =

A. 1

B. $1/3$

C. $1/4$

D. $1/2$

Answer: D

Watch Video Solution

28. In ΔABC, $r(r_1+r_2+r_3)=$

A. $ab + bc + ca - s^2$

B. $ab - bc + ca - s^2$

C. $ab + bc - ca - s^2$

D. $ab + bc + ca + s^2$

Answer: A

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29. In ΔABC, $a(rr_1 + r_2r_3)$=

A. $\frac{ca - r_3r_1}{r_2}$

B. $\frac{r_3r + r_1r_2}{ab}$

C. $\frac{r_3^2}{4R - r_1 - r_2}$

D. abc

Answer: D

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30. In ΔABC, $\frac{1}{r_1}+\frac{1}{r_2}+\frac{1}{r_3}=$

A. Δ/s

B. $1/r$

C. $2/r$

D. $3/r$

Answer: B

Watch Video Solution

31. In any triangle ABC, $r_1r_2+r_2r_3+r_3r_1=$

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

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

C. $\frac{2\Delta}{r}$

D. Δ^2

Answer: A

Watch Video Solution

32. In ΔABC, $(r_1 - r)(r_2 - r)(r_3 - r) =$

A. $4Rr^2$

B. $4Rr^2$

C. R

D. 0

Answer: B

Watch Video Solution

33. In ΔABC, $(r_1 + r_2)(r_2 + r_3)(r_3 + r_1) =$

A. $4Rs^2$

B. $4Rr^2$

C. R

D. 0

Answer: A

Watch Video Solution

34. In ΔABC, $\frac{1}{r_1^2}+\frac{1}{r_2^2}+\frac{1}{r_3^2}+\frac{1}{r^2}=$

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

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

C. $\frac{1}{2Rr}$

D. R

Answer: B

Watch Video Solution

35. In ΔABC, $\frac{\Delta^2}{a^2+b^2+c^2}\left\{\frac{1}{r_1^2}+\frac{1}{r_2^2}+\frac{1}{r_3^2}+\frac{1}{r^2}\right\}=$

A. 1

B. 0

C. s

D. Δ

Answer: A

Watch Video Solution

36. In ΔABC, $\left(\frac{1}{r}-\frac{1}{r_1}\right)\left(\frac{1}{r}-\frac{1}{r_2}\right)\left(\frac{1}{r}-\frac{1}{r_3}\right)=$

A. $\frac{abc}{\Delta^3}$

B. 0

C. $4Rr^2$

D. $1/r$

Answer: A

Watch Video Solution

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

A. $\frac{75}{60}$

B. $\frac{155}{60}$

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

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

Answer: D

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38. In $\Delta ABC, r + r_2 + r_3 - r_1 =$

A. 4 R cos A

B. 4 R cos B

C. 4 R cos C

D. 4R

Answer: D

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39. In $\Delta ABC, r + r_2 + r_3 - r_1 =$

A. 4R cos A

B. 4R cos B

C. 4R cos C

D. 4R

Answer: A

Watch Video Solution

40. In $\Delta ABC, r + r_2 + r_3 - r_1 =$

A. 4 R cos A

B. 4R cos B

C. 4R cos C

D. 4R

Answer: B

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41. IF in a $\Delta ABC, r_3 = r_1 + r_2 + r$, then $\angle A + \angle B =$

A. 120°

B. 100°

C. 90°

D. 80°

Answer: C

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42. In ΔABC, $r_1^2 + r_2^2 + r_3^2 + r^2 =$

A. $16R^2 - \left(a^2 + b^2 + c^2\right)$

B. $16R^2 - \left(a^2 + b^2 - c^2\right)$

C. $16R^2 - \left(a^2 - b^2 + c^2\right)$

D. $16R^2 - \left(a^2 - b^2 - c^2\right)$

Answer: A

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43. In ΔABC, $\dfrac{ab - r_1 r_2}{r_3} =$

A. $\frac{ca - r_3 r_1}{r_2}$

B. $\frac{r_3 r + r_1 r_2}{ab}$

C. $\frac{r_3^2}{4R - r_1 - r_2}$

D. abc

Answer: A

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44. In ΔABC, $\frac{r_1 r + r_2 r_3}{bc} =$

A. $\frac{ca - r_3 r_1}{r_2}$

B. $\frac{r_3 r + r_1 r_2}{ab}$

C. $\frac{r_3^2}{4R - r_1 - r_2}$

D. abc

Answer: B

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45. In $\Delta ABC, r_3 + \frac{r_1 r_2}{r_1 + r_2} =$

A. $\frac{ca - r_3 r_1}{r_2}$

B. $\frac{r_3 r + r_1 r_2}{ab}$

C. $\frac{r_3^2}{4R - r_1 - r_2}$

D. abc

Answer: C

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46. In $\Delta ABC, \sqrt{\left[\frac{r r_1}{r_2 r_3}\right]} =$

A. Δ

B. $\tan \frac{A}{2}$

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

D. $\sin\frac{B}{2}$

Answer: B

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47. In ΔABC, $(r_3 + r_1)\sqrt{\left[\frac{rr_2}{r_3r_1}\right]} =$

A. a

B. b

C. c

D. 0

Answer: B

Watch Video Solution

48. In ΔABC, $r_1r_2\sqrt{\left[\frac{4R - r_1 - r_2}{r_1 + r_2}\right]}$

A. $(r_2 + r_3)\sec^2 \frac{A}{2}$

B. $r_1 r_2 r_3$

C. Δ

D. s

Answer: C

Watch Video Solution

49. In ΔABC, $\frac{r_2(r_3 + r_1)}{\sqrt{r_1 r_2 + r_2 r_3 + r_3 r_1}} =$

A. s^2

B. b

C. c

D. 0

Answer: B

Watch Video Solution

50. In ΔABC, $\frac{b-c}{r_1}+\frac{c-a}{r_2}+\frac{a-b}{r_3}=$

A. s^2

B. b

C. c

D. 0

Answer: D

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51. In ΔABC, $\frac{r_1-r}{a}+\frac{r_2-r}{b}=$

A. a/r_3

B. b/r_3

C. c/r_3

D. 0

Answer: C

Watch Video Solution

52. In ΔABC, $\frac{r_1 - r}{a} + \frac{r_2 - r}{b} + \frac{r_3 - r}{c} =$

A. $\frac{r_1 + r_2 + r_3}{3}$

B. $r_1 + r_2 + r_3$

C. $\frac{r_1 + r_2 + r_3}{2}$

D. $\frac{r_1 + r_2 + r_3}{s}$

Answer: D

Watch Video Solution

53. In $\triangle ABC$ prove that $\frac{r_1}{bc} + \frac{r_2}{ca} + \frac{r_3}{ab} = \frac{1}{r} - \frac{1}{2R}$.

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

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

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

D. $1 - \frac{r}{2R}$

Answer: A

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54. In ΔABC, $rr_1 \cot \frac{A}{2} =$

A. Δ

B. $\tan \frac{A}{2}$

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

D. $\sin \frac{B}{2}$

Answer: A

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55. In $\Delta ABC, r_2 r_3 \tan \frac{A}{2} =$

A. a

B. b

C. c

D. Δ

Answer: D

Watch Video Solution

56. In $\Delta ABC, (r_1 + r_2)\tan \frac{C}{2} =$

A. a

B. b

C. c

D. 0

Answer: C

Watch Video Solution

57. In $\Delta ABC(r_3 - r)\cot\frac{C}{2} =$

A. a

B. b

C. c

D. 0

Answer: C

Watch Video Solution

58. In $\Delta ABC, r\left(\cot\frac{B}{2} + \cot\frac{C}{2}\right) =$

A. a

B. b

C. c

D. 0

Answer: A

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59. In $\Delta ABC, r\left(\cot\frac{A}{2}+\cot\frac{B}{2}+\cot\frac{C}{2}\right)=$

A. s

B. 2s

C. $s/2$

D. $4s$

Answer: A

Watch Video Solution

60. In ΔABC, $r_1 \cot \frac{A}{2} + r_2 \cot \frac{B}{2} + r_3 \cot \frac{C}{2} =$

A. s

B. 2S

C. 3S

D. 4s

Answer: C

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61. In ΔABC, $r\left(r_1 \cot \frac{A}{2} + r_2 \cot \frac{B}{2} + r_3 \cot \frac{C}{2}\right) =$

A. 3s

B. 3Δ

C. $3/\Delta$

D. $2/\Delta$

Answer: B

Watch Video Solution

62. In ΔABC, $(r_1 + r_2)\sec^2\frac{C}{2} =$

A. $(r_2 + r_3)\sec^2\frac{A}{2}$

B. $r_1 r_2 r_3$

C. Δ

D. s

Answer: A

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63. In a triangle ABC , $\frac{r_1 + r_2}{1 + \cos C} =$

A. $2ab/c\Delta$

B. $(a+b)/c\Delta$

C. $abc/2\Delta$

D. abc/Δ^2

Answer: C

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64. In $\Delta ABC, r^3 \cot^2 \frac{A}{2}.\cot^2 \frac{B}{2}.\cot^2 \frac{C}{2} =$

A. $(r_2+r_3)\sec^2 \frac{A}{2}$

B. $r_1 r_2 r_3$

C. Δ

D. s

Answer: B

Watch Video Solution

65. In ΔABC, $4Rr\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2} =$

A. $(r_2 + r_3)\sec^2\frac{A}{2}$

B. $r_1r_2r_3$

C. Δ

D. s

Answer: C

Watch Video Solution

66. In ΔABC, $r^2\cot\frac{A}{2}.\cot\frac{B}{2}.\cot\frac{C}{2} =$

A. $(r_2 + r_3)\sec^2\frac{A}{2}$

B. $r_1r_2r_3$

C. Δ

D. s

Answer: C

Watch Video Solution

67. In ΔABC, $a\cot A + b\cot B + c\cot C =$

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

68. In ΔABC, $a\cot A + b\cot B + c\cot C =$

A. $2(R+r)$

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

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

D. $1-\frac{r}{2R}$

Answer: A

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69. In $\Delta ABC, \cos^2\frac{A}{2}+\cos^2\frac{B}{2}+\cos^2\frac{C}{2}=$

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

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

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

D. $1-\frac{r}{2R}$

Answer: C

Watch Video Solution

70. In $\Delta ABC, \sin^2\frac{A}{2}+\sin^2\frac{B}{2}+\sin^2\frac{C}{2}=$

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

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

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

D. $1-\frac{r}{2R}$

Answer: D

Watch Video Solution

71. The length of the sides of the extriangle of an equilateral triangle in terms of circumradius is

A. $\sqrt{3}R$

B. $2\sqrt{3}R$

C. $\sqrt{2}R$

D. $2\sqrt{2}R$

Answer: B

View Text Solution

72. The distance between orthocentre and circumcentre of an equilateral triangle is

A. 1

B. 0

C. s

D. 2Δ

Answer: B

Watch Video Solution

73. The distance between orthocentre and circumcentre of an equilateral triangle is

A. 0

B. 1

C. 2s

D. 2Δ

Answer: A

Watch Video Solution

74. If ΔABC is an equilateral triangle , then the ratio of the area of the triangle in the area of its pedal triangle is

A. $1:2$

B. $2:3$

C. $4:1$

D. $5:4$

Answer: C

View Text Solution

75. The ratio of circum radii of a triangle to its pedal triangle is

A. $1:2$

B. $2:1$

C. $3:4$

D. $3:5$

Answer: B

View Text Solution

76. IF ΔABC, is an equilateral triangle, then ratio of the sides of the triangle to its ex-centre triangle is

A. $1:2$

B. $2:1$

C. $4:3$

D. $5:3$

Answer: A

View Text Solution

77. 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

Answer: B

Watch Video Solution

78. In a triangle ABC let $\angle C = \pi/2$. If r is the inradius and R is the circumradius of the the triangle ABC, then 2(r+R)=

A. b+c

B. a+b

C. a+b+c

D. c+a

Answer: B

Watch Video Solution

79. 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. Isosceles

C. equilateral

D. Scalene

Answer: B

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80. In $\Delta ABC, \quad \text{if} \quad C = 90^\circ$ then $rr_3 =$

A. $r_1 r_2$

B. $r_1 - r$

C. $a + b$

D. 2

Answer: A

View Text Solution

81. In $\Delta ABC, \quad \text{if} \quad C = 90^\circ$ then $2(r + R) =$

A. $r_1 r_2$

B. $r_1 - r$

C. $a + b$

D. 2

Answer: C

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82. In $\Delta Abc, \quad \text{if} \quad A = 90^\circ$ then $r_2 + r_3 =$

A. $r_1 r_2$

B. $r_1 - r$

C. $a + b$

D. 2

Answer: B

Watch Video Solution

83. In ΔABC, if $A = 90^\circ$ then $\left(1 - \frac{r_1}{r_2}\right)\left(1 - \frac{r_1}{r_3}\right) =$

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

84. In ΔABC, $\frac{r_1}{(s-b)(s-c)} =$

A. abc/Δ^3

B. 0

C. $4Rr^2$

D. $1/r$

Answer: D

Watch Video Solution

85. In ΔABC, $\sum (r+r_1)\tan\left(\frac{B-C}{2}\right) =$

A. $\frac{abc}{\Delta^3}$

B. 0

C. $4Rr^2$

D. $1/r$

Answer: B

Watch Video Solution

86. In ΔABC, if $\left(1-\frac{r_1}{r_2}\right)\left(1-\frac{r_1}{r_3}\right)=2$ then the triangle is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: C

Watch Video Solution

87. In ΔABC, if $(r_1-r_2)(r_3-r_2)=2r_1r_3$, then triangle is

A. equilateral

B. right angled

C. isosceles

D. none

Answer: B

View Text Solution

88. In ΔABC, if a,b,c are in A.P, then r_1, r_2, r_3 are in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: C

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89. In ΔABC, if r_1, r_2, r_3 are in H.P., then a,b,c are in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: A

Watch Video Solution

90. In ΔABC, if $(a-b)(s-c)=(b-c)(s-a)$ then r_1, r_2, r_3 are in

A. A.P.

B. G.P.

C. H.P.

D. None

Answer: B

Watch Video Solution

91. In $\Delta ABC, \quad \text{if} \quad r-1, R=4, \Delta=8$, then ab+bc+ca=

A. 73

B. 81

C. 84

D. 78

Answer: C

Watch Video Solution

92. In $\Delta ABC, \quad \text{if} \quad r_1, r_2, r_3$ are in H.P., then r_2/r=

A. 1

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

93. In ΔABC, if $r_1 = r_2 = r_3$ then the triangle is

A. equilateral

B. right angled

C. isosceles

D. none

Answer: A

View Text Solution

94. In ΔABC, if $rr_1 = r_2r_3$, then the triangle is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: C

Watch Video Solution

95. In ΔABC the roots of the equation $x^3 - (r + 4R)x^2 + s^2x - s^2r = 0$ are

A. r, r_1, r_2

B. r, r_2, r_3

C. r, r_1, r_3

D. r_1, r_2, r_3

Answer: D

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96. In ΔABC, if $r_1 < r_2 < r_3$ then

A. $a < b < c$

B. $a > b > c$

C. $b < a < c$

D. $a < c < b$

Answer: A

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97. In ΔABC, if $2r_1 = 3r_2 = r_3$, then $a : b : c =$

A. $4 : 3 : 5$

B. $3 : 4 : 5$

C. $5 : 3 : 4$

D. $3:5:4$

Answer: A

Watch Video Solution

98. In $\Delta ABC, \quad \text{if} \quad 4r = 3R$ then cos A+ cos B+ cos C=

A. $1/4$

B. $3/4$

C. $5/4$

D. $7/4$

Answer: D

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99. In ΔABC is H is the orthocentre of ΔABC and x= AH, y=BH, z=CH, then x+y+z=

A. r+R

B. $2(r+R)$

C. $\frac{1}{2}(r+R)$

D. $2(r-R)$

Answer: B

Watch Video Solution

100. If the line joining the circumcentre 'O' and the incentre I is parallel to BC, then $\cos B + \cos C$ =

A. $3/2$

B. 1

C. $3/4$

D. 2

Answer: B

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101. In ΔABC, if $2R + r = r_1$ then the triangle is

A. isosceles

B. equilateral

C. right angled

D. none

Answer: C

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102. If A, A_1, A_2, A_3 are the areas of incircle and ex-circle of a triangle respectively then prove that $\frac{1}{\sqrt{A_1}}+\frac{1}{\sqrt{A_2}}+\frac{1}{\sqrt{A_3}}=\frac{1}{\sqrt{A}}$

A. $2/\sqrt{A}$

B. $3/\sqrt{A}$

C. $1/\sqrt{A}$

D. None

Answer: C

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103. The ratio of the area of the incircle to the area of ΔABC is

A. $\frac{\pi}{\sin A \sin B \sin C}$

B. $\frac{\pi}{\cot(A/2)\cot(B/2)\cot(C/2)}$

C. $\frac{\pi}{\cot(A/2)\tan(B/2)\tan(C/2)}$

D. None

Answer: B

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104. If p_1, p_2, p_3 are altitudes of a ΔABC then show that $\frac{1}{p_1}+\frac{1}{p_2}+\frac{1}{p_3}=\frac{1}{r}$

A. $1/r$

B. $1/r_1$

C. $1/r_2$

D. $1/r_3$

Answer: A

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105. IF p_1, p_2, p_3 are the lengths of the altitudes of a triangle from the vertices A,B,C then $1/p_2^1 + 1/p_2^2 + 1/p_3^2 =$

A. $\frac{2ab\cos^2 C/2}{\Delta(a+b+c)}$

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

C. $\frac{\cot A + \cot B + \cot C}{\Delta}$

D. 2R

Answer: C

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106. IF p_1, p_2, p_3 are the lengths of the altitudes of a triangle from the vertices A,B,C then 1/p_1+1/p_2 -1/p_3=`

A. $\frac{2ab\cos^2 C/2}{\Delta(a+b+c)}$

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

C. $\frac{\cot A + \cot B + \cot C}{\Delta}$

D. 2R

Answer: A

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107. IF p_1, p_2, p_3 are the lengths of the altitudes of a triangle from the vertices A,B,C then $\frac{\cos A}{p_1} + \frac{\cos B}{p_2} + \frac{\cos C}{p_3} =$

A. $\frac{2ab\cos^2 C/2}{\Delta(a+b+c)}$

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

C. $\frac{\cot A + \cot B + \cot C}{\Delta}$

D. 2R

Answer: B

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108. IF p_1, p_2, p_3 are the lengths of the altitudes from the vertices of ΔABC to the opposite sides, then $\frac{a\cot A}{p_1}+\frac{b\cot B}{p_2}+\frac{c\cot C}{p_3}=$

A. $1/r$

B. $1/R$

C. $1/r_3$

D. 2

Answer: D

Watch Video Solution

109. IF p_1, p_2, p_3 are the lengths of the altitudes from the vertices of ΔABC to the opposite sides, then $p_1p_2p_3$=

A. $1/r$

B. $1/R$

C. $1/r_3$

D. 8'delta'^(3)/abc

Answer: D

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110. If in a triangle ABC, the altitudes from the A,B,C on opposite sides are in H.P. then sinA, sin B, sin C are in

A. G.P.

B. A.P.

C. Arithmetic- Geometric Progression

D. H.P.

Answer: B

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111. If $\Delta ABC, A'B'C'$ are such that $B = B', A + A' = 180^\circ$, then aa'=

A. $aa' + /$

B. bb'+cc'

C. aa'+cc'

D. None

Answer: B

View Text Solution

EXERCISE 1C

1. From the top a mast of 180 mt high, the angle of depression of an object is 60° The distance of the object from the ship is

A. $180\sqrt{3}$

B. $60\sqrt{3}$

C. 60

D. $60/\sqrt{3}$

Answer: B

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2. From the top of a building h meters, the angle of depression of an object on the ground is α. the distance(in meter) of the object from the foot of the building is

A. $h\cot\alpha$

B. $h\tan\alpha$

C. $h\cos\alpha$

D. $h\sin\alpha$

Answer: A

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3. If a flag staff of 6 mt high placed on the top of a tower throws a shadow of $2\sqrt{3}$ mt along the ground then the angle that the Sun makes with the ground is

A. 45°

B. 30°

C. 75°

D. 60°

Answer: D

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4. The shadow of the tower standing on a level ground is found to be 60 metres longer when the sun's altitude is 30° then when it is 45°. The height of the tower is

A. 60 m

B. 30 m

C. $60\sqrt{3}m$

D. $30\left(\sqrt{3}+1\right)m$

Answer: D

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5. The sum of angles of elevation of the top of a tower from two points distance a and b from the base and in the same straight line with it is 90°. Then the height of the tower is :

A. a^2b

B. ab^2

C. $\sqrt{ab}$

D. ab

Answer: C

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6. AB is a vertical pole with B at the ground level and and A at the top .A man finds that the angle of elevation of the point A from a certain point C on the ground is 60° . He moves away from the pole along the line BC to a point D such that CD = 7 m .From D . the angle of elevation of the point A is 45° .Find the height of the pole .

A. $\frac{7\sqrt{3}}{2}(\sqrt{3}+1)m$

B. $\frac{7\sqrt{3}}{2}(\sqrt{3}-1)m$

C. $\frac{7\sqrt{3}}{21}\frac{1}{\sqrt{3}+1}m$

D. $\frac{7\sqrt{3}}{21}\frac{1}{\sqrt{3}-1}m$

Answer: A

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7. A person walking along a straight road towards a hill observes at two points distances $\sqrt{3}$ km. The angle of elevation of the hill to be 30° and 60°. The height of the hill is

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

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

C. $\frac{\sqrt{3}+1}{2}km$

D. $\sqrt{3}km$

Answer: A

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8. The angle of elevation of an object from a point P on the level ground is a. Moving d metres on the ground towards the object, the angle of elevation is found to be β. Then the height (in metres) of the object is

A. $d\tan\alpha$

B. $d \cot \beta$

C. $\frac{d}{\cot \alpha + \beta\beta}$

D. $\frac{d}{\cot \alpha - \cot \beta}$

Answer: D

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9. The angle of elevation of the top of a tower from a point on the same level as the foot of the tower is 15°. On moving 100 metres towards the tower, the angle of elevation increases to 30°. The height of the tower is

A. 50

B. 100

C. 150

D. 200

Answer: A

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10. From a point on the level ground, the angle of elevation of the top of a pole is 30°. On moving 20 metres nearer, the angle of elevation is 45°. Then the height of the pole, in metres , is

A. $10\left(\sqrt{3}-1\right)$

B. $10\left(\sqrt{3}+1\right)$

C. 15

D. 20

Answer: B

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11. The elevation of an object on a hill is observed from a certain point in the horizontal plane through its base, to be 30°. After walking 120 metres

towards it on level ground the elevation is found to be 60° . Then the height of the object (in metres) is

A. 120

B. $60\sqrt{3}$

C. $120\sqrt{3}$

D. 60

Answer: B

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12. A tower, of x metres high, has a flagstaff at its top. The tower and the flagstaff subtend equal angles at a point distant y metres from the foot of the tower. Then the length of the flagstaff in metres in

A. $\frac{y\left(x^2-y^2\right)}{\left(x^2+y^2\right)}$

B. $\frac{x\left(y^2+x^2\right)}{\left(y^2-x^2\right)}$

C. $\frac{x\left(x^2+y^2\right)}{\left(x^2-y^2\right)}$

D. $\frac{x\left(x^2-y^2\right)}{\left(x^2+y^2\right)}$

Answer: B

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13. A flag staff of length 'd' stands on tower of height h. IF at a point on the ground the angle of elevation of the tower and top of the flag staff be α, β then h=

A. $\frac{d\cot\beta}{\cot\alpha-\cot\beta}$

B. $\frac{d\tan\beta}{\cot\alpha-\cot\beta}$

C. $\frac{d\cot\beta}{\cot\alpha-\cot\beta}$

D. None

Answer: A

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14. The angles of elevation of a tower from two points which are at distances $h_1$and h_2 from the foot of the tower on the same side are complementary. The height of the tower is

A. $\sqrt{h_1 h_2}$

B. $h_1 h_2$

C. h_1 / h_2

D. $\sqrt{h_1 / h_2}$

Answer: A

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15. A flag staff on the top of the tower 80 mt of height subtends an angle $\tan^{-1}(1/9)$ at a point on the ground 100 mt from the foot of the tower. The height of the flag staff is

A. 19 mt

B. 20 mt

C. 21 mt

D. 22 mt

Answer: B

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16. The angles of elevation of a cliff at a point A on the ground and at a point B, 100 mt vertically at A are α and β respectively. The height of the cliff in mt is

A. $\frac{100\tan\beta}{\cot\beta-\cot\alpha}$

B. $\frac{100\cot\beta}{\cot\beta-\cot\alpha}$

C. $\frac{100\tan\beta}{\cot\alpha+\cot\beta}$

D. $\frac{100\cot\beta}{\cot\alpha+\cot\beta}$

Answer: B

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17. The top of a hill observed from the top and bottom of a building of height h is at angle of elevation p and q respectively. The height of the hill is

A. $\frac{h\cot p}{\cot p - \cot q}$

B. $\frac{h\cot q}{\cot p - \cot q}$

C. $\frac{h\cot p}{\cot p + \cot q}$

D. $\frac{h\cot q}{\cot p + \cot q}$

Answer: A

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18. A flag staff of 5 mts high stands on a building of 25 mt high. At an observer at a height of 30 mt the flag staff and the building subtend equal angles. The distance of the observer from the top of the flag staff is

A. $5\sqrt{3}$

B. $5\sqrt{2}$

C. $5\sqrt{6}$

D. $\frac{5\sqrt{3}}{\sqrt{2}}$

Answer: D

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19. From the top of a building 60 m high the angle of elevation of the top of a tower is found to be angle of depression of the foot of the tower. The height of the tower in meter is

A. 100

B. 90

C. 120

D. 105

Answer: C

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20. The horizontal distance between two towers is 60m and the angular depression of the top of the first as seen from the second, which is 150 m hight is 30°. The height of the first tower is

A. $\left(150+20\sqrt{3}\right)m$

B. $\left(150+15\sqrt{3}\right)m$

C. $\left(150-20\sqrt{5}\right)m$

D. $\left(150-20\sqrt{3}\right)m$

Answer: D

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21. From the top of a cliff 60 mt high, the angles of depression of top and bottom of a tower are 30°, 60°. The height of the tower is

A. 40 mt

B. 50 mt

C. 60 mt

D. 30 mt

Answer: A

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22. From the top of the hill h metres high the angles of depression of the top and the bottom of a pillar are α and β respectively. The height (in metres) of the pillar is

A. $\frac{h(\tan\beta - \tan\alpha)}{\tan\beta}$

B. $\frac{h(\tan\alpha - \tan\beta)}{\tan\alpha}$

C. $\frac{h(\tan\beta + \tan\alpha)}{\tan\beta}$

D. $\frac{h(\tan\beta + \tan\alpha)}{\tan\alpha}$

Answer: A

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23. These are two towers on a horizontal line. From the mid point of the line joining their feet, the tops of the towers appear at angles of elevation of 60° and 30° respectively. The first tower has a height of 100 m. The height of the second tower is

A. $\frac{100}{\sqrt{3}}m$

B. $\frac{100}{5}m$

C. $\left(\sqrt{2}\right)100m$

D. $\frac{100}{3}m$

Answer: D

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24. The angles of elevation of the tops of two vertical towers as seen from the middle point of the line joining the foot of the towers are $60^\circ, 30^\circ$ respectively. The ratio of the heights of the towers is

A. $2:1$

B. $\sqrt{3}:1$

C. $3:2$

D. $3:1$

Answer: D

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25. P is a point on the segment joining the feet to vertical poles of heights a and b, The angles of elevation of the tops of the poles from P are 45° each. Then the square of the distance between the tops of the poles is:

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

B. a^2+b^2

C. $2\left(a^2+b^2\right)$

D. $4\left(a^2+b^2\right)$

Answer: C

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26. A tower subtends angles $\alpha, 2\alpha, 3\alpha$ respectively at points A,B and C all lying on a horizontal line through the foot of the tower, Then $\frac{AB}{BC} =$

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

B. $1+2\cos 2\alpha$

C. $2+\cos 2\alpha$

D. $\frac{\sin 2\alpha}{\sin \alpha}$

Answer: B

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27. The angle of elevation of a cloud from a point h mt above the surface of a lake is θ and the angle of depression of its reflection in the lake is φ. The height of the cloud is

A. $\frac{h\sin(\varphi+\theta)}{\sin(\varphi-\theta)}$

B. $\frac{h\sin(\varphi-\theta)}{\sin(\varphi+\theta)}$

C. $\frac{h\sin(\theta+\varphi)}{\sin(\theta-\varphi)}$

D. $\frac{h\sin(\theta-\varphi)}{\sin(\theta+\varphi)}$

Answer: A

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28. The angle of elevation of a stationary cloud from a point 2500 mt above a lake is 15° and the angle of depression of its reflection in the lake is 45°. The height of the cloud is

A. $2500 / \sqrt{3} mt$

B. $2500 mt$

C. $2500 \sqrt{3} mt$

D. None

Answer: C

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29. The angle of elevation of the top of the tower observed from each of the three points A,B,C on the ground, forming a triangle is the same anlge α. IF R is the circumradius of the ΔABC, then the height of the tower is

A. $R \sin \alpha$

B. $R \cos \alpha$

C. $R \cot \alpha$

D. $R \tan \alpha$

Answer: D

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30. A person stading on the bank of a river observerves that the angle of elevation of the top of the tree on the opposite bank of the river is 60° and when he retires 40 meters away from the tree the angle of elevation becomes 30°. The breadth of the river is

A. 20 m

B. 60 m

C. 40 m

D. 30 m

Answer: A

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31. ABC is a triangular park with AB=AC=100 meters. A clock tower is situated at the mid point of BC. The angles of elevation of the tower at A and B are $\cot^1(3.2)$ and $\text{cosec}^{-1}(2.6)$ respectively. The height of the tower is

A. 100 mt

B. 50 mt

C. 25 mt

D. $50\sqrt{3}mt$

Answer: C

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32. An aeroplane flying with uniform speed horizontally one kilometer above the ground id observed at an elevation of 60°. Aftar 10s if the elevation is observed to be 30°, then the speed of the aeroplane (in km/h) is

A. $240/\sqrt{3}$

B. $200\sqrt{3}$

C. $240\sqrt{3}$

D. $120/\sqrt{3}$

Answer: C

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33. The upper $3/4^{th}$ portion of a vertical pole subtends an angle $\tan^{-1}(3/5)$ at a point in the horizontal plane through its foot and at a distance 40 m from the foot . Given that the vertical pole is at a height less than 100m from the gound ,find its height .

A. 20m

B. 40m

C. 60m

D. 80m

Answer: A

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34. A vertical pole subtends an angle $\tan^{-1}\left(\frac{1}{2}\right)$ at a point P on the ground. IF the angles subtended by the upper half and the lower half of the pole at P are respectively α and β, then $(\tan\alpha, \tan\beta)$=

A. $\left(\frac{1}{4}, \frac{1}{5}\right)$

B. $\left(\frac{1}{5}, \frac{2}{9}\right)$

C. $\left(\frac{2}{9}, \frac{1}{4}\right)$

D. $\left(\frac{1}{4}, \frac{2}{9}\right)$

Answer: C

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35. The angle of elevation of a stationar cloud from a point 2500 m above a lake is 15° and from the same point the angle of depression of its reflectin in the lake is 45°. The height (in meters) of the cloud above the lake, given that $\cot 15^\circ = 2 + \sqrt{3}$, is

A. 2500

B. $2500\sqrt{2}$

C. $2500\sqrt{3}$

D. 5000

Answer: C

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36. A lamp post is sittuated at the middle point M of the side AC of a triangular plot ABC with BC=m CA =8 m and AB =9 m. Lamp post subleds an anlgle 15° at the point B. The height of the lamp post is

A. $2-\sqrt{3}$

B. $\sqrt{3}-2$

C. $7\left(2-\sqrt{3}\right)$

D. $7\left(\sqrt{3}-2\right)$

Answer: C

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37. A tree stands vertically on the slant of the hills From a point A on the ground 35 meters. Down the hill from the base of the tree , the angle of elevation of the top of the tree is 60°. If the angle of elevation of the foot of the tree A is 15°, then the height of the tree.

A. $5\sqrt{2}$

B. $7\sqrt{2}$

C. $25\sqrt{2}$

D. $35\sqrt{2}$

Answer: D

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38. An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position and nature of the image.

A. $3\sqrt{2}$

B. $7\sqrt{2}$

C. $25\sqrt{2}$

D. $35\sqrt{2}$

Answer: A

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39. Two ships leave a port at the same time . One goes 24km per hour in the direction $N45^\circ$ E and other travels 32km per hour in the direction

$S75^\circ E$. then the distance between the ships at the end of 3 hours

A. 7488

B. $\sqrt{7488}$

C. 5184

D. $\sqrt{5184}$

Answer: B

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40. Two trees A and B are on the same side of a river. From a point C in the river the distances of the trees A and B are 250 m and 300 m respectively. IF the angle C is 45°, the distance the trees is

A. 215.5

B. 225.5

C. 215

D. 225

Answer: A

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41. The angle of elevation of the toop point P of the vertical tower PQ of height h from a point A 45° and from a point B is 60° , where B is a point at a distance 30 meters from the point A measured along the line AB which makes an angle 30° with AQ . Then the height of the tower is.

A. $5\left(\sqrt{3}+1\right)$

B. $10\left(\sqrt{3}+1\right)$

C. $15\left(\sqrt{3}+1\right)$

D. $20\left(\sqrt{3}+1\right)$

Answer: C

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42. AB is a vertical pole with B at the ground level and and A at the top .A man finds that the angle of elevation of the point A from a certain point C on the ground is 60° . He moves away from the pole along the line BC to a point D such that CD = 7 m .From D . the angle of elevation of the point A is 45° .Find the height of the pole .

A. $7(3+\sqrt{3})$

B. $\frac{7}{2}(3+\sqrt{3})$

C. $\frac{7}{3}(3+\sqrt{3})$

D. $\frac{7}{4}(3+\sqrt{3})$

Answer: B

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43. A person observes the top of a tower from a point A on the ground. the elevation of the tower from this point is 60°. He moves 60 m in the direction prpendicular to the line joining A and base of the tower. The

angle of elevation of the tower from this point is 45°. Then the height of the tower (in meters) is _____

A. $60\frac{\sqrt{3}}{2}$

B. $60\sqrt{2}$

C. $60\sqrt{3}$

D. $60\frac{\sqrt{2}}{3}$

Answer: A

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44. A bird is sitting on the top of a vertical pole 20 m high and its elevation from a point O on the ground is 45°. It flies off horizontally straight away from the point O. After one second, the elevation of the bird from O is reduced to 30°. Then the speed (in m/s) of the bird is

A. $20\sqrt{2}$

B. $20\left(\sqrt{3}-1\right)$

C. $40\left(\sqrt{2}-1\right)$

D. $40\left(\sqrt{3}-\sqrt{2}\right)$

Answer: B

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

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

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

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

Answer: C

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EXERCISE 2 (SPECIAL TYPE QUESTIONS) SET 1

1. Which of the following statements is true

I : If $(a+b+c)(a+b-c)=ab$ then $\angle C=60^\circ$

II If $\sin^2 A+\sin^2 B+\sin C=2$ in a ΔABC then it is right angled

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: B

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2. I: In a ΔABC, if a=3,b=4, $\angle A=30^\circ$ the number of possible triangles is 2

II. In a ΔABC, $\frac{(a+b)\cos C+(b+c)\cos A+(c+a)\cos B}{\sin A+\sin B+\sin C}=R$

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: A

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3. I: In a ΔABC, if a= R tan A then $b^2 + c^2 = bc + a^2$

II: In a ΔABC if sin A+ sin B+ sin C is maximum then triangle is equilateral

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: C

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4. I: In a ΔABC, if $4s(s-a)(s-b)(s-c) = a^2b^2$ then it is right angled triangle

II: In a $\Delta ABC, \sin A + \sin B + \sin C$ is maximum then triangle is equilateral

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: C

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5. In ΔABC, if $(a-b)(s-c)=(b-c)(s-a)$ then r_1, r_2, r_3 are in

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: A

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6. In ΔABC, if $rr_1 = r_2 r_3$, then the triangle is

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: D

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7. In a ΔABC, if $r_1 = s$ then the triangle is equilateral

II: In a $\Delta ABC, r = (s-b)\cot(C/2)$

A. only I is true

B. only II is true

C. both I, II are true

D. neither I nor II is true

Answer: D

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8. In ΔABC, the correct formule among the following are

Statement -I : $r = 4R\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$

Statement -II : $r_1 = (s-a)\tan\frac{A}{2}$

Statement-III : $r_3 = \frac{\Delta}{s-c}$

A. only I, II

B. only II, III

C. only I, III

D. I, II, III

Answer: C

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9. In ΔABC, with usual notation observe the two statements given below

Statement -I : $rr_1r_2r_3 = \Delta^2$

Statement -II : $r_1r_2 + r_2r_3 + r_3r_1 = s^2$

Which of the following statement 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: A

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10. Observe the following statements:

I) In $\Delta ABC, b\cos^2\frac{C}{2} + c\cos^2\frac{B}{2} = s$ II. In $\Delta ABC, \cot\frac{A}{2} = \frac{b+c}{2} \Rightarrow B = 90^\circ$

Which of the following 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: B

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EXERCISE 2 (SPECIAL TYPE QUESTIONS) Set -2

1. The ascending order of $\alpha = \cot\frac{A}{2}\cot\frac{C}{2}$ when $s = 4b, \beta = \cot\frac{B}{2}\cot\frac{C}{2}$ when s=3a, $\gamma = \cos\frac{A-C}{2}\cos ec\frac{B}{2}$ When a,b,c are in A.P.is

A. α, β, γ

B. β, α, γ

C. γ, α, β

D. α, γ, β

Answer: B

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2. In a $\Delta ABC, A > C$ and $A - C = 90^\circ$ and $a + b = 2b$ and if $\alpha = \sin\frac{B}{2}, \beta = \cos\frac{B}{2}, \gamma = \tan\frac{B}{2}$ then ascending order of α, β, γ is

A. α, β, γ

B. β, α, γ

C. γ, α, β

D. α, γ, β

Answer: B

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3. IF $(a + b)^2 = c^2 + ab$ in a ΔABC and if $\sqrt{2}(\sin A + \cos A) = \sqrt{3}$ then ascending order of angles A,B,C is

A. A,B,C

B. A,C,B

C. B,A,C

D. C,B,A

Answer: B

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4. If a= 30, b = 18, c = 24 then the descending order of r_1, r_2, r_3 is

A. r_1, r_3, r_2

B. r_3, r_2, r_1

C. r_2, r_3, r_1

D. r_1, r_2, r_3

Answer: A

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5. In ΔABC, if $r_1 = 3, r_2 = 10, r_3 = 15$, then c=

A. a,b,c

B. b,c,a

C. c,a,b

D. c,b,a

Answer: D

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EXERCISE 2 (SPECIAL TYPE QUESTIONS) Set -3

1. Match the following

I. In $\Delta ABC, (a-b)^2 \cos^2\frac{C}{2} + (a+b)^2 \sin^2\frac{C}{2} =$	a) c^2
II. In $\Delta ABC, \frac{b^2-c^2}{a^2}\sin^2 A + \frac{c^2-a^2}{b^2}\sin^2 B =$	b) $\frac{1}{b}$
III. In $\Delta ABC, \frac{bc\cos A + ca\cos B + ab\cos C}{\cot A + \cot B + \cot C} =$	c) 2Δ
IV. In $\Delta ABC, \frac{\cos C + \cos A}{c+a} + \frac{\cos B}{b} =$	d) $\frac{b^2-a^2}{4R^2}$

A. a,b,c,d

B. a,d,c,b

C. d,a,b,c

D. a,c,d,b

Answer: B

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2. Match the following

I. In ΔABC, $a^2 \sin 2C + c^2 \sin 2A$	a) 4Δ
II. In ΔABC, $R^2 (\sin 2A + \sin 2B + \sin 2C)$	b) 2Δ
III. In ΔABC, $a \sin^2 \frac{C}{2} + c \sin^2 \frac{A}{2} =$	c) s
IV. In ΔABC, $c \cos^2 \frac{A}{2} + a \cos^2 \frac{C}{2} =$	d) $s - b$

A. a,b,d,c

B. c,d,a,b

C. d,a,b,c

D. a,c,d,b

Answer: A

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3. Match the following

I. In ΔABC, $\Sigma a^2 \sin(B-C)$	a) Δ^2
II. In ΔABC, $\Sigma a^3 \cos(B-C)$	b) 0
III. In ΔABC, $rr_1 r_2 r_3$	c) $1/r$
IV. In ΔABC, $\frac{1}{r_1}+\frac{1}{r_2}+\frac{1}{r_3}$	d) $3\,abc$
	e) 2Δ

A. b,d,a,c

B. c,b,e,d

C. d,a,b,e

D. e,c,d,a

Answer: A

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4. Match the following

I. In ΔABC, if $a = 5, A = 30^\circ$ then	a) $A = 120^\circ$
II. In ΔABC, if $a = 8, b = 15, c = 17$ then	b) $r = R$
III. In ΔABC, if $b = c = R$ then	c) $R = 17/2$
IV. In an equilateral triangle	d) $R = 5$
	e) $r = R/2$

A. e,b,d,c

B. b,a,c,d

C. a,d,b,a

D. d,c,a,c

Answer: D

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5. Match the following

I. In ΔABC, if $\cot\frac{A}{2}, \cot\frac{B}{2}, \cot\frac{C}{2}$ are in A.P. then

II. In ΔABC, if $\frac{a}{c} = \frac{\sin(A-B)}{\sin(B-C)}$ then

III. In ΔABC, if a, b, c are in A.P, then

IV. In ΔABC, if $(a-b)(s-c) = (b-c)(s-a)$ then

a) r_1, r_2, r_3 are in A.P.

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

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

d) r_1, r_2, r_3 are in G.P.

e) r_1, r_2, r_3 are in H.P.

A. d,e,a,b

B. b,c,a,e

C. a,b,d,c

D. c,d,b,e

Answer: B

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6. Match the following

I. In ΔABC if $r_1 = r_2 = r_3$ then the triangle is

II. In ΔABC if $rr_1 = r_2r_3$ then the triangle is

III. In ΔABC, $a\cos B = b\cos A$

IV. In ΔABC $a\cos A = b\cos B$

a) right angled triangle

b) equilateral triangle

c) right angled or isosceles triangle

d) scalene triangle

e) isosceles triangle

A. a,b,d,e

B. c,d,b,a

C. b,a,e,c

D. d,e,c,b

Answer: C

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7. Match the following

I. In $\Delta ABC, (r_1 - r)(r_2 - r)(r_3 - r)$	a) $4R$
II. In $\Delta ABC, (r_1 + r_2)(r_2 + r_3)(r_3 + r_1)$	b) $4R\,r^2$
III. In $\Delta ABC, r_1 + r_2 + r_3 - r$	c) $4R\,s^2$
IV. In $\Delta ABC, r + r_3 + r_1 - r_2$	d) $4R\cos A$
	e) $4R\cos B$

A. a,b,c,d

B. c,a,e,d

C. b,a,c,d

D. b,c,a,e

Answer: D

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EXERCISE 2 (SPECIAL TYPE QUESTIONS) Set-4

1. A: In a ΔABC, if the sides a,b,c are in A.P. then $a\cos^2\frac{C}{2}+c\cos^2\frac{A}{2}=3b$

R: In a ΔABC, if A,B,C are in A.P. then $B=\pi/3$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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2. A: In a $\Delta ABC, r_1r_2r_3 = s^2$

R: In an equilateral triangle , $r : R : r_1 = 1 : 4 : 5$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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3. A: In a $\Delta ABC(a + b + c)(b + c - a) = Abc$ if $0 < \lambda < 4$

R: In a $\Delta ABC, \ -1 \leq \cos A \leq 1$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

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4. A: In a ΔABC, if $r_1 = 2r_2 = 3r_3$ then $a:b = 5:4$.

R: In a ΔABC, if $xr_1 = yr_2 = zr_3 = (x+y+z)r$ then $a:b:c = y+z:z+x:x+j$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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5. A: There is no triangle ABC for $A = \tan^{-1} 2, B = \tan^{-1} 3$

R: IF $x > 0, y > 0$ and $xy > 1$ then $\tan^{-1} x + \tan^{-1} y = \pi + \tan^{-1}\left(\frac{x+y}{1-xy}\right)$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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6. A: In a ΔABC, if A,B,C are in A.P. and triangle is equilateral cos A+2 cos B+ cos C=2

R: In a ΔABC, if A,B,C are in A.P. and cos A+ cos B+ cos C=2 then the triangle is isosceles.

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

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7. A:In ΔABC, if r_1, r_2, r_3 are in H.P. then $r_2/r = 1/3$

R: In ΔABC, $\frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3} = \frac{2}{r}$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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8. A: In a ΔABC, $\left(1-\frac{r_1}{r_2}\right)\left(1-\frac{r_1}{r_2}\right)=2$ then the triangle is right angled.

R: In a ΔABC, $r_1r_2+r_2r_3+r_3r_1=2r^2$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C

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9. A: IF In a ΔABC, $c\cos^2\frac{A}{2}+a\cos^2\frac{C}{2}=\frac{3b}{2}$ then a,b,c are In A.P.

R: In a ΔABC, $a\cos C+c\cos A=b$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A

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10. A: In a ΔABC, $\Delta = a^2 - (b-c)^2$ then $\tan\frac{A}{2} = \frac{1}{2}$

R: In a ΔABC, $\tan\frac{A}{2} = \frac{\Delta}{(s-b)(s-c)}$

A. A is true, R is true and R is correct explanation of A

B. A is true, R is true and R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D

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