MATHS

BOOKS - MODERN PUBLICATION

MATHS (KANNADA ENGLISH)

SOLUTION OF TRIANGLES

Level I

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

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

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

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

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

Answer: A

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2. Let the angles A, B, C of ΔABC be in $A.\ P.$ and let $b:c=\sqrt{3}:\sqrt{2}$, then angle A is :

A. 45°

B. 60°

C. 75°

D. None of these

Answer: C

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3. If $b = 3$, $c = 4$, $B = 60^\circ$, then the number of triangles that can be constructed is

A. nil

B. 1

C. 2

D. infinitely many

Answer: A

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

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

B. $\sqrt{2} : 2 : (\sqrt{3}+1)$

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

D. $2 : (\sqrt{3}+1) : \sqrt{2}$

Answer: B

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5. If in a triangle ABC, $2\cos A = \sin B \cos ecC$,

then :

A. $a = b$

B. $b = c$

C. $c = a$

D. $2a = bc$

Answer: C

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6. If $\Delta = a^2 - (b - c)^2$, where Δ is area of ΔABC, then $\tan A$ is

A. $15/16$

B. $8/17$

C. $8/15$

D. $1/2$

Answer: C

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7. In a triangle ABC, angle $B = 60^\circ$, then

A. $(a-b)^2 + ab = c^2$

B. $(b-c)^2+bc=c^2$

C. $(c-a)^2+ca=b^2$

D. $a^2+b^2+c^2=2b^2+ac$

Answer: C

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8. In a ΔABC, if $a+b=3c$, then the value of $\cot.\frac{A}{2}\cot.\frac{B}{2}$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

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9. If the sides a,b,c of a triangle are in A.P., then the value of $\cot.\frac{A}{2}\cot.\frac{C}{2}$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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10. In a triangle ABC, if $\angle B = 60^\circ$, then the expression $(a+b+c)(a-b+c)$ is

A. $3ab$

B. $3bc$

C. $3ca$

D. $3abc$

Answer: C

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11. Ther perimeter of a triangle is 6 times the A.M of the sines of its angles . If sides $a = 1$, then angle A is

A. $\pi/6$

B. $\pi/4$

C. $\pi/3$

D. $\pi/2$

Answer: A

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12. In a triangle ABC, if $a\cos A = b\cos B$, then the triangle is

A. isosceles

B. equilateral

C. right-angled isosceles

D. None of these

Answer: C

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13. If the lengths of the sides of a triangle are $3, 4$ and 5 units then R (the circumradius) is

A. 2.0

B. 3.0

C. 2.5

D. 3.5

Answer: C

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14. The expression :

$$\frac{(a+b+c)(b+c-a)(c+a-b)(a+b-c)}{4b^2c^2}$$

is :

A. $\cos^2 A$

B. $\sin^2 A$

C. $\cos 2A$

D. $1 - \cos A$

Answer: B

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15. In ΔABC, $a = 4$, $b = 12$, $B = 60^\circ$, then the value of $\sin A$ is :

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

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

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

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

Answer: C

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16. If H is the orthocentre of ΔABC , then AH is

A. $b\cot A$

B. $\cot A$

C. $a\cot A$

D. $a\cot B$

Answer: C

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17. In ΔABC, $a = 2$, $b = 3$ and $\sin A = \frac{2}{3}$, then B is

A. 60°

B. 120°

C. 30°

D. 90°

Answer: D

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18. Two sides of a triangle are $\sqrt{3}+1$ and $\sqrt{3}-1$ and the included angle is 60°. The difference of the remaining angles is

A. 90°

B. 60°

C. 45°

D. 30°

Answer: A

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

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

B. $5 - \sqrt{6}$

C. $3\sqrt{3}$

D. 5

Answer: A

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20. If the sides of a triangle are $3cm$, $2cm$ and $4cm$ then the cosine of the greatest angle is equal to

A. $\frac{7}{8}$

B. $\frac{11}{16}$

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

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

Answer: C

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21. In any ΔABC, $\sum a^3 \sin(B-C)$ is equal to

A. $ab + bc + ca$

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

C. $3abc$

D. 0

Answer: D

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

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

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

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

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

Answer: D

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

A. Equilateral

B. Right-angled

C. Isosceles

D. None of these

Answer: C

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24. If in a triangle ABC,AD,BE and CF are altitudes and R is the circum-radius, then then radius of the circle DEF is

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

B. R

C. $2R$

D. None of these

Answer: A

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25. If in a triangle , $\angle B = 45^\circ, a = 2\left(\sqrt{3}+1\right)$ units and the area is $6+2\sqrt{3}$ sq.units then the side b is equal to :

A. $\sqrt{2}\left(\sqrt{3}+1\right)$ units

B. $\frac{\sqrt{3}+1}{\sqrt{2}}$ units

C. 4units

D. None of these

Answer: C

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26. If the lengths of the sides of a triangle are $3, 5, 7$, then the largest angle of the triangle is

A. $3\pi/4$

B. $2\pi/3$

C. $5\pi/6$

D. $\pi/2$

Answer: B

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27. In a ΔABC , $a(b\cos C - \cos B)$ is equal to

A. 0

B. $b^2 - c^2$

C. a^2

D. None of these

Answer: B

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

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

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

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

D. None of these

Answer: C

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29. In a triangle ABC, $(a+b+c)(b+c-a)=\lambda bc$ if :

A. $o<\lambda<4$

B. $\lambda>4$

C. $\lambda<0$

D. $\lambda>0$

Answer: A

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30. Let R be the circumradius of ΔABC. Then $\frac{b^2 - c^2}{2aR}$ equals

A. $\cos B - \cos C$

B. $\cos(B - c)$

C. $\sin(B - C)$

D. None of these

Answer: C

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31. In a ΔABC, $\tan.\frac{A}{2}$ and $\tan.\frac{B}{2}$ satisfy $6x^2 - 5x + 1 = 0$. 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: B

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

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

B. $\left(\sqrt{6}-\sqrt{2}\right)cm$

C. $\left(\sqrt{6}+\frac{1}{\sqrt{2}}\right)cm$

D. None of these

Answer: C

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33. In a ΔABC, $a = 2b$ and $|A - B| = \frac{\pi}{3}$.

Then $\angle C$ is

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

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

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

D. None of these

Answer: C

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34. If in a ΔABC,

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

, then $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$ equals

A. 0

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

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

D. None of these

Answer: A

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35. If in a ΔABC, $\frac{a}{\cos A} = \frac{b}{\cos B}$, then :

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

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

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

D. None of these

Answer: A

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Level Ii

1. If in ΔABC , $\cot A$, $\cot B$, $\cot C$ are in A.P., then

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

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

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

D. None of these

Answer: B

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2. The sides of a triangle are in A.P and its area is $\frac{3}{5} \times$ (area of equilateral triangle of same perimeter). Then the ratio of the sides to :

A. $1:2:3$

B. $1:3:5$

C. $3:5:7$

D. None of these

Answer: C

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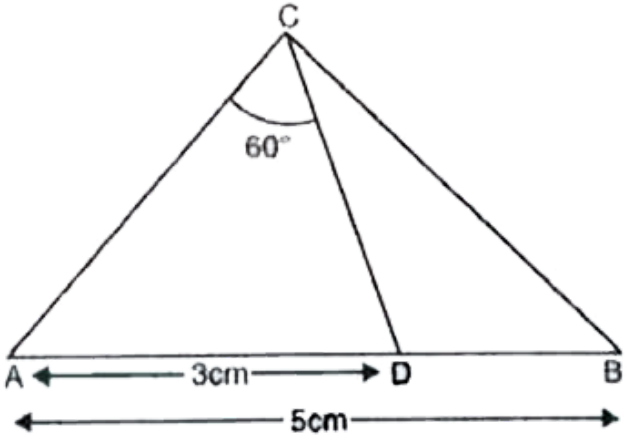
3. In the figure, ABC is a triangle in which $\angle C = 90^\circ$ and $AB = 5cm$. D is a point on AB such that $AD = 3cm$ and $\angle ACD = 60^\circ$. Then the length of AC is



A. $\frac{3}{\sqrt{7}}cm$

B. $\sqrt{\frac{7}{3}}cm$

C. $5\sqrt{\frac{3}{7}}cm$

D. None of these

Answer: C

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4. In ΔABC, $\frac{a\cos A + b\cos B + \cos C}{a+b+c}$ equals: where R and r are circum-radius and in -radius respectively

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

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

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

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

Answer: B

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5. The ratio of R : r of an equilateral triangle is : where R and r are circumradius and inradius respectively

A. $1:1$

B. $2:1$

C. $3:1$

D. $2:\sqrt{3}$

Answer: B

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6. H.M of exradii of a triangle is

A. $2R$

B. $3r$

C. $R + r$

D. None of these

Answer: B

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7. In ΔABC, the inradius and exradii are r, r_1, r_2 and r_3 respectively. Then $r.\, r_1 r_2 r_3$ equals

A. Δ^2

B. 2Δ

C. $\frac{abc}{4R}$

D. None of these

Answer: A

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

A. less than $\frac{b+c}{2}$

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

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

D. None of these

Answer: C

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9. In ΔABC, $\cos A + \cos B + \cos C > 1$ only if the triangle is

A. acute-angled

B. right-angled

C. obtuse-angled

D. Nothing can be said about the nature of the triangle.

Answer: D

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10. Let A_0, A_1, A_2, A_3, A_4 and A_5 be the consecutive vertices of a regular hexagon inscribed in a circle of radius 1 unit. Then the

product of the lengths of A_0A_1, A_0A_2 and A_0A_4 is

A. 3

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

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

D. $3\sqrt{3}$

Answer: A

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11. In a ΔABC , if D is the middle point of BC and AD is perpendicular to AC, then $\cos C$ equals

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

B. $\frac{2b}{a}$

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

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

Answer: D

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12. If the angles of a triangle ABC satisfy the equation :

$81^{\sin^2 x} + 81^{\cos^2 x} = 30$, then the triangle can't be

A. right-angled

B. isosceles

C. equilateral

D. obtuse-angled

Answer: A

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13. If $n, n+1, n+2$ where $n \in N$, represent the sides of a triangle ABC, in which the largest angle is twice the smallest, then n is equal to

A. 1

B. 2

C. 3

D. 4

Answer: C

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14. If in ΔABC, $\frac{\cos A}{7} = \frac{\cos B}{19} = \frac{\cos C}{25} = k$, then :

$$\begin{vmatrix} -\frac{1}{k} & 25 & 19 \\ 25 & -\frac{1}{k} & 7 \\ 19 & 7 & -\frac{1}{k} \end{vmatrix}$$ equals

A. 0

B. $26 - \sec^3 C$

C. $32 - \sec^2 B$

D. $42 - \sec^3 A$

Answer: A

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15. In a ΔABC, if $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = 0$, then : $\sin A \sin B + \sin B \sin C + \sin C \sin A$ equals

A. 0

B. 1

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

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

Answer: C

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16. In a ΔABC, if $A = 18^\circ, b - a = 2, ab = 4$, then the triangle is

A. right-angled

B. isosceles

C. acute-angled

D. obtuse-angled

Answer: D

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

A. 1

B. 3

C. 7

D. 9

Answer: A

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18. If in a ΔABC, sines of angles A and B satisfy : $4x^2 - 2\sqrt{6}x + 1 = 0$,then $\cos(A - B)$ equals

A. 0

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

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

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

Answer: B

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19. In ΔABC, if the median AD makes an angle θ with AC, and $AB = 2AD$, then $\sin\theta$ equals

A. $\sin C$

B. $\sin B$

C. $\sin A$

D. None of these

Answer: C

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20. In a ΔABC, if $Re(\sin A + \sin B + \sin C) = 96$, then the area of the triangle in square units, equals

A. 24

B. 48

C. 72

D. 96

Answer: D

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21. In a ΔABC, 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 $\frac{1}{s-a}+\frac{1}{s-b}+\frac{1}{s-c}$ equals

A. 0

B. 1

C. 2

D. 3

Answer: C

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22. The distance of the incentre of ΔABC from A is

A. $4R\sin.\ \frac{A}{2}$

B. $4R\sin.\ \frac{B}{2}$

C. $4R\sin.\ \frac{B}{2}\sin.\ \frac{C}{2}$

D. None of these

Answer: C

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23. In a ΔABC, 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. Right-angled

C. acute-angled

D. obtuse-angled

Answer: B

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24. If in ΔABC, $\frac{b+c}{11} = \frac{c+a}{12} = \frac{a+b}{13}$, then $\cos A$ equals :

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

B. $\frac{5}{9}$

C. $\frac{17}{35}$

D. None of these

Answer: A

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25. If p_1, p_2, p_3 are respectively the perpendiculars from the vertices of a triangle to the opposite sides, then $p_1 p_2 p_3$ equals

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

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

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

D. $\frac{a^2 b^2 c^2}{16R^3}$

Answer: C

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26. If $\frac{a}{\cos A} = \frac{b}{\cos B} = \frac{c}{\cos C}$, then triangle is

A. isosceles

B. Right-angled

C. equilateral

D. obtuse-angled

Answer: C

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

A. s^2

B. a^2b^2

C. b^2c^2

D. c^2a^2

Answer: B

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28. If the lengths of the sides of a ΔABC are $3, 4$ and $5cm$, then the distance between its incentre and circumcentre is

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

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

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

D. None of these

Answer: C

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29. If the lengths of the sides of a ΔABC are $3, 4$ and $5cm$, then the distance between its orthocentre and circumcentre is

A. $2cm$

B. $2.5cm$

C. $1.5cm$

D. None of these

Answer: B

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30. If A,B,C are the angles of a triangle, then the value of $\cot.\frac{A}{2}+\cot.\frac{B}{2}+\cot.\frac{C}{2}$ is

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

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

C. $\frac{\Delta}{s^2}$

D. $\frac{s^2}{\Delta}$

Answer: D

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31. The area of a circle is A_1 and the area of a regular pentagon inscribed in the circle is A_2. Then A_1 / A_2 is

A. $\frac{2\pi}{5}\sec.\frac{\pi}{10}$

B. $\frac{2\pi}{5}\cos.\frac{\pi}{10}$

C. $\frac{2\pi}{5}\cot.\frac{\pi}{10}$

D. None of these

Answer: A

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32. In a triangle ABC , $2ac\sin.\frac{1}{2}(A-B+C)$

is equal to :

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: B

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33. In a triangle ABC, let $\angle C = \pi/2$. If r is the inradius 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: A

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34. The number of distinct real roots of $\begin{vmatrix} \sin x & \cos x & \cos x \\ \cos x & \sin x & \cos x \\ \cos x & \cos x & \sin x \end{vmatrix} = 0$ in the interval $\frac{-\pi}{4} \leq x \leq \frac{\pi}{4}$ is :

A. 0

B. 1

C. 2

D. 3

Answer: C

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35. In a triangle ABC, $2ca \sin. \frac{A-B+C}{2} =$

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: B

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36. In a ΔABC, $\tan. \frac{A}{2} = \frac{5}{6}$, $\tan. \frac{C}{2} = \frac{2}{5}$, 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

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37. 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: A

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38. In a triangle with sides $a, b, c, r_1 > r_2 > r_3$ (which are extradii), then

A. $a > b > c$

B. $a < b < c$

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

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

Answer: A

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39. The sides of a triangle are $3x + 4y$, $4x + 3y$ 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

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40. Which of the following pieces of data does NOT uniequely 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: D

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41. If in a triangle ABC, $a\cos^2.\frac{C}{2}+\cos^2.\frac{A}{2}=\frac{3b}{2}$, then the sides a, b, c

A. are in $G.P.$

B. are in $H.P.$

C. satsify $a+b=c$

D. are in $A.P.$

Answer: D

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

A. $\frac{16}{3}$

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

C. $\frac{64}{3}$

D. $\frac{8}{3}$

Answer: B

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43. The sum of the radii of inscribed and circumscribed circles for an n-sided regular polygon of side 'a' is

A. $\frac{a}{4}\cot\left(\frac{\pi}{2n}\right)$

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

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

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

Answer: C

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44. The angles of a triangle are in the ratio $4:1:1$, then the ratio of the largest side to the perimeter is

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

B. $2:3$

C. $\sqrt{4}:2+\sqrt{3}$

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

Answer: C

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

A. 60°

B. 90°

C. 120°

D. 150°

Answer: C

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

A. $1:3:5$

B. $2:3:4$

C. $3:2:1$

D. $1:2:3$

Answer: D

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

A. $A.\ P.$

B. $G.\ P.$

C. $H.\ P.$

D. Arithmetic-Geometric progression

Answer: A

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48. If a,b,c are sides opposite to the angles A,B,C, then which of the following is correct ?

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

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

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

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

Answer: D

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49. A triangular park is enclosed on two sides by a fence and on the third side of straight river bank. The two sides having fence 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: C

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50. 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 the sides of ΔABC, then :

A. Ae is H.M. Between b and c

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

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

D. the triangle AEF is isosceles

Answer: A::B::C::D

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1. For a regular polygon, let r and R be the radii of the inscribed and the circumscribed

circles. A false statement among the following is

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

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

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

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

Answer: C

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

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

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

C. 1

D. $\sqrt{3}$

Answer: D

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3. Let ABC be a triangle such that $\angle ACB = \frac{\pi}{6}$ and let a, b and c denote the lengths of the sides opposite to A, B and C respectively. The value (s) of x for which

$a = x^2 + x + 1$, $b = x^2 - 1$ and $c = 2x + 1$

is (are)

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

B. $1 + \sqrt{3}$

C. $2 + \sqrt{3}$

D. $4\sqrt{3}$

Answer: B

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4. Let PQR be a triangle of area Δ 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 at P,Q and R respectively. Then $\frac{2\sin P - \sin 2P}{2\sin P + \sin 2P}$ equals

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

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

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

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

Answer: C

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5. 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. $\dfrac{p^2 + q^2 \cos\theta}{p\cos\theta + q\sin\theta}$

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

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

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

Answer: D

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