MATHS

BOOKS - TARGET MATHS (HINGLISH)

TRIGONOMETRIC FUNCTIONS

Classical Thinking

1. If $\sin\theta = \frac{3}{4}$ and $\tan\theta = \frac{9}{2}$, then $\cos\theta$ is

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

B. $\frac{8}{27}$

C. $\frac{27}{8}$

D. $\frac{15}{4}$

Answer: A

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2. If $5\sin\theta = 3,$ then $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta}$ is equal to

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

B. 4

C. 2

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

Answer: B

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3. $\frac{\sin\theta}{1 - \cot\theta} + \frac{\cos\theta}{1 - \tan\theta} =$

A. 0

B. 1

C. $\cos\theta - \sin\theta$

D. $\cos\theta + \sin\theta$

Answer: D

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4. If $\sin\theta = -\frac{1}{\sqrt{2}}$ and $\tan\theta = 1$ then θ lies in which quadrant

A. first quadrant

B. second quadrant

C. third quadrant

D. fourth quadrant

Answer: C

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5. If $\sin\theta = -\frac{1}{2}$ and $\cos\theta = \frac{\sqrt{3}}{2}$, then θ lies in

A. 1^{st} quadrant

B. II^{nd} quadrant

C. III^{rd} quadrant

D. IV^{th} quadrant

Answer: D

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6. When $x = \frac{\pi}{2}$, then tan x is

A. 1

B. 0

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

D. not defined

Answer: D

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7. Find the value of the : sin^2 pi/6 + cos^2 pi/3 - tan^2 pi/4`

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

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

C. $\sqrt{3}$

D. 1

Answer: B

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8. If $x\sin 45^\circ \cos^2 60^\circ = \frac{\tan^2 60^\circ \cos ec30^\circ}{\sec 45^\circ \cot^2 30^\circ}$ then x

A. 2

B. 4

C. 8

D. 16

Answer: C

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9. If $\sin\theta = \sqrt{3}\cos\theta$, then θ is equal to

A. 45°

B. 30°

C. 75°

D. 60°

Answer: D

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10. If $\sin(\alpha - \beta) = \frac{1}{2}$ and $\cos(\alpha + \beta) = \frac{1}{2}$, where$\alpha$ and β are positive acute angles, then α and β are

A. $\alpha = 45^\circ, \beta = 15^\circ$

B. $\alpha = 15^\circ, \beta = 45^\circ$

C. $\alpha = 60^\circ, \beta = 15^\circ$

D. $\alpha = 15^\circ, \beta = 60^\circ$

Answer: A

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11. If $\tan\theta = \frac{20}{21}$, then $\cos\theta$ is equal to

A. $\pm\frac{20}{41}$

B. $\pm\frac{1}{21}$

C. $\pm\frac{21}{29}$

D. $\pm\frac{20}{21}$

Answer: C

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12. If $\tan\theta = -\frac{1}{\sqrt{10}}$ and θ lies in the fourth quadrant, then $\sec\theta =$

A. $\frac{1}{\sqrt{11}}$

B. $\frac{-1}{\sqrt{11}}$

C. $\sqrt{\frac{11}{10}}$

D. $-\sqrt{\frac{10}{11}}$

Answer: C

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13. If $\tan\theta = \frac{1}{\sqrt{5}}$ and θ lies in the first quadrant, the value of $\cos\theta$ is :

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

B. $-\frac{1}{\sqrt{6}}$

C. $\frac{\sqrt{5}}{\sqrt{6}}$

D. $-\frac{\sqrt{5}}{\sqrt{6}}$

Answer: C

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14. If $\sin\theta = \frac{21}{29}$ and θ lies in the second quadrant, find the value of $\sec\theta + \tan\theta$ is

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

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

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

D. $-\frac{5}{2}$

Answer: D

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15. $\sec^4 x - \sec^2 x$ is equal to

A. $\tan^4 x - \tan^2$

B. $\tan^4 x + \tan^2 x$

C. $\tan^2 x - \tan^4 x$

D. $2\tan^2 x$

Answer: B

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16. Which of the following is ture ?

A. $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$

B. $\sec^2 \cos ec^2\theta = \sec^2\theta - \cos ec^2\theta$

C. $\cos ec^2\theta + \cot^2\theta = \cos ec^2\theta \cot^2\theta$

D. none of these

Answer: A

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17. If $x = \sec\theta + \tan\theta,$ then $x + \frac{1}{x} = .$

A. 1

B. $2\sec\theta$

C. 2

D. $2\tan\theta$

Answer: B

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18. $\cot x + \tan x =$

A. $\cot 2x$

B. $2\cot^2 x$

C. $\sec x \cos ecx$

D. $\cot^2 2x$

Answer: C

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19. The value of $\frac{\sin^2 20^\circ + \cos^4 20^\circ}{\sin^4 20^\circ + \cos^2 20^\circ}$ is

A. 0

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

C. 1

D. 2

Answer: C

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20. If $x = a\cos\theta + b\sin\theta$ and $y = a\sin\theta - b\cos\theta$. then$a^2 + b^2$ is equal to

A. $x^2 - y^2$

B. $x^2 + y^2$

C. $(x + y)^2$

D. $(x - y)^2$

Answer: B

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21. If $x = a\cos^3\theta, y = b\sin^3\theta$, then

A. $\left(\frac{a}{x}\right)^{\frac{2}{3}} + \left(\frac{b}{y}\right)^{\frac{2}{3}} = 1$

B. $\left(\frac{b}{x}\right)^{\frac{2}{3}} + \left(\frac{a}{y}\right)^{\frac{2}{3}} = 1$

C. $\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}} = 1$

D. $\left(\frac{x}{b}\right)^{\frac{2}{3}}+\left(\frac{y}{a}\right)^{\frac{2}{3}}=1$

Answer: C

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22. If $\cos x+\cos^2 x=1,$. then the value of $\sin^2 x+\sin^4 x$is

A. 1

B. -1

C. 0

D. 2

Answer: A

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23. If $\sin x+\sin^2 x=1,$ then$\cos^8 x+2\cos^6 x+\cos^4 x$=

A. 0

B. -1

C. 2

D. 1

Answer: D

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24. Which one of the following is incorrect ?

A. $\sin\theta = -\frac{1}{5}$

B. $\cos\theta = 1$

C. $\sec\theta = \frac{1}{2}$

D. $\tan\theta = 20$

Answer: C

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25. Which of the following is possible ?

A. $\cos\theta = \frac{7}{5}$

B. $\sin\theta = \frac{8}{5}$

C. $\sec\theta = \frac{4}{5}$

D. $\tan\theta = 45$

Answer: D

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26. The smallest value of $3\cos\theta + 4\sin\theta + 12$ is

A. 5

B. 12

C. 7

D. 17

Answer: C

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Critical Thinking

1. If $\tan\theta = \frac{p}{q}$ then the value of $\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta}$ is

A. $\frac{p^2 - q^2}{p^2 + q^2}$

B. $\frac{p^2 + q^2}{p^2 - q^2}$

C. 0

D. $\frac{p - q}{p + q}$

Answer: A

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2. The value of $\cos^2\theta + \sec^2\theta$ is always

A. less than 1

B. equal to 1

C. greater then 1, but less than 2

D. greater than or equal 2

Answer: D

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3. If $\sin x + \cos ecx = 2$ then $\sin^n x + \cos ec^n x = ?$

A. 2

B. 2^n

C. 2^{n-1}

D. 2^{n-1}

Answer: A

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4. Which of the following relations is correct ?

A. $\sin 1 < \sin 1^\circ$

B. $\sin 1 > \sin 1^\circ$

C. $\sin 1 = \sin 1^\circ$

D. $\frac{\pi}{180}\sin 1 = 1^\circ$

Answer: B

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5. Which of the following is correct ?

A. $\tan 1 > \tan 2$

B. $\tan 1 = \tan 2$

C. $\tan 1 < \tan 2$

D. $\tan 1 = 1$

Answer: A

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6. If $\cos A = \frac{\sqrt{3}}{2}$, then $\tan 3A =$

A. 0

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

C. 1

D. not defined

Answer: D

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7. If $\tan(A-B)=1, \sec(A+B)=\frac{2}{\sqrt{3}}$, then the smallest positive value of B is. $\frac{25\pi}{24}$ (b) $\frac{19\pi}{24}$ (c) $\frac{13\pi}{24}$ (d) $\frac{11\pi}{24}$

A. $\frac{25\pi}{24}$

B. $\frac{19\pi}{24}$

C. $\frac{13\pi}{24}$

D. $\frac{11\pi}{24}$

Answer: B

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8. If $\sin(A+B+C)=1, \tan(A-B)=1/\sqrt{3}$ and $\sec(A+C)=2$, then

A. $A=120^\circ, B=60^\circ, C=0^\circ$

B. $A=60, B=30^\circ, C=0^\circ$

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

D. $A = 120^\circ, B = 0^\circ, C = 60^\circ$

Answer: B

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9. If $\cos A = \frac{3}{5}, \cos B = \frac{4}{5}$ and $\frac{-\pi}{2} < A < 0, \frac{-\pi}{2} < B < 0,$ then the value of $2\sin A + 4\sin B =$

A. 4

B. 2

C. -4

D. 0

Answer: C

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10. If $\tan\theta + \sec\theta = \sqrt{3}, 0 < \theta < \pi,$ then θ is equal to

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

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

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

D. $\frac{5\pi}{6}$

Answer: B

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11. If $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$, then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$ is equal to

A. $\sec\theta - \tan\theta$

B. $\sec\theta + \tan\theta$

C. $\tan\theta - \sec\theta$

D. $\sec^2\theta + \tan^2\theta$

Answer: C

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12. If `pi/2

A. $2\sec\theta$

B. $-2\sec\theta$

C. $2\cos ec\theta$

D. $2\cos\theta$

Answer: B

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13. If `pi

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

B. $-\frac{2}{\sin\alpha}$

C. $\frac{1}{\sin\alpha}$

D. $-\frac{1}{\sin\alpha}$

Answer: B

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14. If A lies in second quadrant and $3\tan A + 4 = 0,$ then the value of $2\cot A - 5\cos A + \sin A$ is equal to $-53/10$ (b) $23/10$ $37/10$ (d) 7/10

A. $\frac{-53}{10}$

B. $\frac{-7}{10}$

C. $\frac{7}{10}$

D. $\frac{23}{10}$

Answer: D

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15. If $\sec\theta - \tan\theta = \frac{1}{2},$ then θ lies in the

A. first quadrant

B. second quadrant

C. third quadrant

D. fourth quadrant

Answer: A

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16. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$ then $\cos\theta - \sin\theta$ is equal to

A. $\sqrt{2}\sin\theta$

B. $2\sin\theta$

C. $-\sqrt{2}\sin\theta$

D. $\sqrt{2}\cos\theta$

Answer: A

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17. If $\sin x + \cos x = a$ then $|\sin x - \cos x| =$

A. $\sqrt{2 - a^2}$

B. $\sqrt{2 + a^2}$

C. $\sqrt{a^2 - 2}$

D. $\sqrt{a^2 - 4}$

Answer: A

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18. If $3\sin\theta + 4\cos\theta = 5$, then find the value of $4\sin\theta - 3\cos\theta$.

A. 0

B. -5

C. 5

D. 4

Answer: A

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19. If $u_n = \sin^n \theta + \cos^n \theta,$ then $2u_6 - 3u_4$ is equal to

A. -1

B. $12 \sin^2 \theta \cos^2 \theta$

C. 1

D. $12 \tan^2 \theta \cos^2 \theta$

Answer: A

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20. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x - 2$ is equal to

A. 0

B. 1

C. -1

D. 2

Answer: C

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21. If $10\sin^4 \alpha + 15\cos^4 \alpha = 6$, then find the value of $27\cos ec^6 \alpha + 8\sec^6 \alpha$.

A. 125

B. 250

C. 50

D. 75

Answer: B

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22. $\sin\alpha = \dfrac{2xy}{x^2+y^2} \Rightarrow \sec\alpha - \tan\alpha =$

A. $\dfrac{p-q}{p+q}$

B. $\dfrac{pq}{p^2+q^2}$

C. $\dfrac{p+q}{p-q}$

D. $\dfrac{pq}{P+q}$

Answer: A

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23. If $\sec\theta - \tan\theta = \dfrac{a+1}{a-1}$, then $\cos\theta =$

A. $\frac{a^2+1}{a^2-1}$

B. $\frac{a^2-1}{a^2+1}$

C. $\frac{2a}{a^2+1}$

D. $\frac{2a}{a^2-1}$

Answer: B

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24. If $\sec\theta = x + \frac{1}{4x}$, then $sec\theta + tan\theta =$ $x, \frac{1}{x}$ (b) $2x, \frac{1}{2x}$ (c) $-2x, \frac{1}{2x}$ (d) $-\frac{1}{x}, x$

A. $-2x$ or $\frac{1}{2x}$

B. $\frac{1}{2x}$ or $4x$

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

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

Answer: D

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25. The value of

$\sin^6\left(\frac{\pi}{49}\right)+\cos^6\left(\frac{\pi}{49}\right)-1+3\sin^2\left(\frac{\pi}{49}\right)\cos^2\left(\frac{\pi}{49}\right)$ is equal to

A. $\tan^6\frac{\pi}{49}$

B. $\cot^6\frac{\pi}{49}$

C. 1

D. 0

Answer: D

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26. If $\frac{2\sin\alpha}{\{1+\cos\alpha+\sin\alpha\}}=y,$ then $\frac{\{1-\cos\alpha+\sin\alpha\}}{1+\sin\alpha}=$

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

B. x

C. $1 - x$

D. $1 + x$

Answer: B

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27. The value of the expression

$$1 - \frac{\sin^2 y}{1 + \cos y} + \frac{1 + \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$$ is

A. 0

B. 1

C. $\sin y$

D. $\cos y$

Answer: D

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28. $\frac{2\sin\theta\cdot\tan\theta(1-\tan\theta)+2\sin\theta\sec^2\theta}{(1+\tan\theta)^2}=$

A. $\frac{\sin\theta}{1+\tan\theta}$

B. $\frac{2\sin\theta}{1+\tan\theta}$

C. $\frac{2\sin\theta}{(1+\tan\theta)^2}$

D. $\frac{\sin\theta}{(1+\tan\theta)^2}$

Answer: B

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29. If A is an obtause angle, then $\frac{\sin^3 A-\cos^3 A}{\sin A-\cos A}+\frac{\sin A}{\sqrt{a+\tan^2 A}}-2\tan A\cot A.$ is always equal to

A. 1

B. -1

C. 2

D. -2

Answer: B

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30. $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1, \frac{x}{a}\sin\theta - \frac{y}{b}\cos\theta = 1$ then $\frac{x^2}{a^2} + \frac{y^2}{b^2} =$

A. 2

B. 0

C. -2

D. 1

Answer: A

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31. If $x\sin^3\alpha + y\cos^3\alpha = \sin\alpha\cos\alpha$ and $x\sin\alpha - y\cos\alpha = 0$ then $x^2 + y^2 =$

A. -1

B. ± 1

C. 1

D. 0

Answer: C

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32. If $a\cos^3\alpha + 3a\cos\alpha\sin^2\alpha = m$ and $a\sin^2\alpha + 3a\cos^2\alpha\sin\alpha = n$ then $(m+n)^{\frac{2}{3}} + (m-n)^{\frac{2}{3}} =$

A. $2a^2$

B. $2a^{\frac{1}{3}}$

C. $2a^{\frac{2}{3}}$

D. $2a^3$

Answer: C

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33. IF

$\tan^2\alpha\tan^2\beta+\tan^2\beta\tan^2\gamma+\tan^2\gamma\tan^2\alpha+2\tan^2\alpha+\sin^2\beta+\sin^2\gamma$

is

A. 0

B. -1

C. 1

D. 2

Answer: C

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34. If $p = \frac{2\sin\theta}{1+\cos\theta+\sin\theta}$, and $q = \frac{\cos\theta}{1+\sin\theta}$, then

A. $pq = 1$

B. $\frac{q}{p} = 1$

C. $q - p = 1$

D. $p + q = 1$

Answer: D

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35. If $x = \sec\phi - \tan\phi$ and $y = \cos ec\phi + \cot\phi$, then

A. $x = \frac{y+1}{y-1}$

B. $x = \frac{y-1}{y+1}$

C. $y = \frac{1-x}{1+x}$

D. $y = \frac{1+x}{(1-x)^2}$

Answer: B

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36. If $\sin\theta_1 + \sin\theta_2 + \sin\theta_3,$ then $\cos\theta_1 + \cos\theta_2 + \cos\theta_3$ is equal to 3

(b) 2 (c) 1 (d) 0

A. 3

B. 2

C. 1

D. 0

Answer: D

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37. If $\frac{(a+b)^2}{4ab} = \sin^2\theta,$ then

A. $2a = b$

B. $a = b$

C. $a = 2b$

D. $a = -b$

Answer: B

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38. The maximum value of $12\sin\theta - 9\sin^2\theta$ is

A. 3

B. 4

C. 5

D. 2

Answer: B

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39. If $A = \sin^2\theta + \cos^4\theta$, then for all real values of θ

A. $y \in [1, 2]$

B. $y \in [13/16, 1]$

C. $y \in [3/4, 13/16]$

D. $y \in [3/4, 1]$

Answer: D

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Competitive Thinking

1. If θ lies in the first quadrant and $5\tan\theta = 4$, then $\dfrac{5\sin\theta - 3\cos\theta}{\sin\theta + 2\cos\theta} =$

A. 0

B. 1

C. $\frac{1}{6}$

D. 6

Answer: C

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2. The $\sin\theta + \text{cosec}\theta = 2$, then: $\sin^2\theta + \text{cosec}^\circ\theta$=

A. 1

B. 3

C. 2

D. 4

Answer: C

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3. If $\sin\theta + \cos ec\theta = 2$, then the volume of $\sin^{10}\theta + \cos ec^{10}\theta$, is

A. 10

B. 2^{10}

C. 2^9

D. 2

Answer: D

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4. If $tanA + \cot A = 4,$ then $\tan^4 A + \cot^4 A$ is equal to 110 b. 191 c. 80 d. 194

A. 110

B. 191

C. 80

D. 194

Answer: D

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5. The value of $\sin 200^\circ + \cos 200^\circ$ is

A. negative

B. positive

C. zero

D. zero or positive

Answer: A

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6. $\cos 1^\circ . \cos 2^\circ . \cos 3^\circ \ldots . \cos 179^\circ =$

A. 0

B. 1

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

D. -1

Answer: A

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7. If $x \in \left[0. \frac{\pi}{2}\right], y \in \left[0, \frac{\pi}{2}\right]$ and $\sin x + \cos y = 2,$ then the value of $x + y$ is equal to

A. 2π

B. π

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

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

Answer: D

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8. If $\sin\theta - \cos\theta = 1$, then the value of $\sin^3\theta - \cos^3\theta$ is _____

A. 1

B. -1

C. 0

D. 2

Answer: A

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9. If $\tan\theta = -\frac{4}{3}$, then $\sin\theta$ is

A. $-4/5$ but not 4/5

B. $-4/5$ or $4/5$

C. $4/5$ but not $-4/5$

D. Neither $\frac{4}{5}$ nor $\frac{-4}{5}$

Answer: B

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10. If $\sin\theta = \frac{24}{25}$ and θ lies in the second quadrant, then $\sec\theta + \tan\theta =$

A. -3

B. -5

C. -7

D. -9

Answer: C

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11. If $\sin\theta = \frac{2t}{1+t^2}$ and θ lies in 2nd quadrant ,then $\cos\theta$ is equal to

A. $\frac{1-t^2}{1+t^2}$

B. $\frac{t^2-1}{1+t^2}$

C. $\frac{-|t-t^2|}{1+t^2}$

D. $\frac{1+t^2}{|1-t^2|}$

Answer: C

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12. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{\cos ec^2\alpha + 2\cot\alpha}$ is equal to

A. $1+\cot\alpha$

B. $1-\cot\alpha$

C. $-1\cot\alpha$

D. $-1+\cot\alpha$

Answer: C

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13. If $\cos ec\theta - \cot\theta = 2017,$ then quadrant in which θ lies is

A. I

B. IV

C. III

D. II

Answer: D

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14. If $\cos ec\theta - \cot\theta = \frac{1}{2}, 0 < \theta < \frac{\pi}{2},$ then $\cos\theta$ is equal to

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

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

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

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

Answer: D

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15. If $\cos ecA + \cot A = \frac{11}{2}$, then tan A equal to

A. $\frac{21}{22}$

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

C. $\frac{44}{117}$

D. $\frac{117}{43}$

Answer: C

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16. If $\sec\theta + \tan\theta = p,$ then $\tan\theta$ is equal to

A. $\frac{2p}{p^2-1}$

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

C. $\frac{p^2+1}{2p}$

D. $\frac{2p}{p^2+1}$

Answer: B

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17. If $tan\theta + sec\theta$, then $\cos\theta$ equals $\frac{e^x + e^{-x}}{2}$ (b) $\frac{2}{e^x + e^{-x}}$ (c) $\frac{e^x - e^{-x}}{2}$ (d) $\frac{e^x - e^{-x}}{e^x + e^{-x}}$

A. $\frac{(e^x + e^{-x})}{2}$

B. $\frac{2}{(e^x + e^{-x})}$

C. $\frac{(e^x - e^{-x})}{2}$

D. $\frac{e^x - e^{-x}}{(e^x + e^{-x})}$

Answer: B

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18. If $\sin\theta + \cos\theta = 1$ then $\sin\theta\cos\theta =$

A. 0

B. 1

C. 2

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

Answer: A

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19. If $3\sin A + 5\cos A = 5,$ then the value of $(3\cos A - 5\sin A)^2$ is

A. 4

B. 5

C. 2

D. 9

Answer: D

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20. If $\sec\theta = m, \tan\theta = n$, then $\frac{1}{m}\left\{(m+n) + \frac{1}{m+n}\right\}$

A. 2

B. 2m

C. 2n

D. mn

Answer: A

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21. If $\sin\theta + \cos\theta = m$ and $\sec\theta + \cos ec\theta = n$ then $n(m+1)(m-1)$ equals

A. m

B. n

C. 2m

D. 2n

Answer: C

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22. If $2y\cos\theta = x\sin\theta$ and $2x\sec\theta - y\cos ec\theta = 3,$ then $x^2 + 4y^2 =$

A. 4

B. -4

C. -2

D. 2

Answer: A

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23. If $\tan\theta + \sin\theta = 1, \quad \text{then} \cos^2\theta = n \quad \text{then} m^2 - n^2$ is equal

A. $m^2 - n^2 = 4mn$

B. $m^2 - n^2 = 4mn$

C. $m^2 - n^2 = m^2 + n^2$

D. $m^2 - n^2 = 4\sqrt{m}n$

Answer: D

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24. If $(\sec\alpha + \tan\alpha)(\sec\beta + \tan\beta)(\sec\gamma + \tan\gamma) = \tan\alpha\tan\beta\tan\gamma$, then $(\sec\alpha - \tan\alpha)(\sec\beta - \tan\beta)(\sec\gamma - \tan\gamma) =$

A. $\cot\alpha\cot\beta\cot\gamma$

B. $\tan\alpha\tan\beta\tan\gamma$

C. $\cot\alpha+\cot\beta+\cot\gamma$

D. $\tan\alpha+\tan\beta+\tan\gamma$

Answer: A

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25. If $P_n=\cos^n\theta+\sin^n\theta$ then $2P_6-3P_4+1=$

A. 2

B. 3

C. 0

D. 1

Answer: C

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26. Prove: $(\sec A + \tan A - 1)(\sec A - \tan A + 1) = 2\tan A$

A. $\sec A$

B. $2\sec A$

C. 0

D. 1

Answer: C

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27. 17.$\cos^4\theta - \sin^4\theta$ is equal to (a) 1 -2$\sin^2\left(\frac{\theta}{2}\right)$ (b)$2\cos^2\theta - 1$ (c) $1 + 2\sin^2\left(\frac{\theta}{2}\right)$ (d)$1 + 2\cos^2\theta$

A. $1 - e\sin^2\left(\frac{\theta}{2}\right)$

B. $2\cos^2\theta - 1$

C. $1 + 2\sin^2\left(\frac{\theta}{2}\right)$

D. $1 + 2\cos^2\theta$

Answer: B

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28. Prove each of the following identities :

$(i)\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta\cos^2\theta$

$(ii)\sin^2\theta + \cos^4\theta = \cos^2\theta + \sin^4\theta$

$(iii)\text{cosec}^4\theta - \text{cosec}^2\theta = \cot^4\theta + \cot^2\theta$

A. 0

B. -1

C. 1

D. none of these

Answer: C

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29. Find the value of $6\left(\sin^6\theta+\cos^6\theta\right)-9\left(\sin^4\theta+\cos^4\theta\right)+4$

A. -3

B. 0

C. 1

D. 3

Answer: C

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30. If $\sin x+\sin^2 x=1$, then find the value of $\cos^{12}x+3\cos^{10}x+3\cos^8 x+\cos^6 x-1$

A. 2

B. 1

C. -1

D. 0

Answer: D

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31. The value of k, for which

$(\cos x + \sin x)^2 + k \sin x \cos x - 1 = 0$ is an identity, is

A. -1

B. -2

C. 0

D. 1

Answer: B

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32. If $sec^2\theta = \frac{4xy}{(x+y)^2}$ is true if and only if $x + y \neq 0$ (b) $x = y, x \neq 0$ (c) $x = y$ (d) $x \neq 0, y \neq 0$

A. $x = y$

B. $x < y$

C. $x > y$

D. none of these

Answer: A

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33. Let $\theta \in \left(0, \frac{\pi}{4}\right)$ and $t_1 = (\tan\theta)^{\tan\theta}, t_2 = (\tan\theta)^{\cot\theta}, t_3 = (\cot\theta)^{\tan\theta}$ and t_4 then

A. $t_1 > t_2 > t_3 > t_4$

B. $t_4 > t_3 > t_1 > t_2$

C. $t_3 > t_1 > t_2 > t_4$

D. $t_2 > t_3 > t_1 > t_4$

Answer: B

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Evaluation Test

1. If $\sin A = a\cos B$ and $\cos A = b\sin B$then, $(a^2-1)\tan^2 A + (1-b^2)\tan^2 B$ is equal to

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

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

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

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

Answer: B

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2. If $\tan\theta = \frac{x\sin\phi}{1-x\cos\phi}$ and $\tan\phi = \frac{y\sin\theta}{1-y\cos\theta}$, then $\frac{x}{y} =$ (A) $\frac{\sin\phi}{\sin\theta}$ (B) $\frac{\sin\theta}{\sin\phi}$ (C) $\frac{\sin\phi}{1-\cos\theta}$ (D) $\frac{\sin\theta}{1-\cos\phi}$

A. $\frac{\sin\phi}{\sin\theta}$

B. $\frac{\sin\theta}{\sin\phi}$

C. $\frac{\sin\phi}{1-\cos\theta}$

D. $\frac{\sin\theta}{1-\cos\phi}$

Answer: B

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3. If $a\sin^2 x + b\cos^2 x = c, b\sin^2 y + a\cos^2 y = d$ and $a\tan x = b\tan y$ then $\frac{a^2}{b^2} = \ldots\ldots . \left(0 < x, y < \frac{\pi}{2}\right)$

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

B. $\frac{(a-d)(c-a)}{(b-c)(d-b)}$

C. $\frac{(d-a)(c-a)}{(b-c)(d-b)}$

D. $\frac{(b-c)(d-b)}{(c-a)(a-d)}$

Answer: B

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4. If $\text{cosec}\ \theta - \sin\theta = m, \sec\theta - \cos\theta = n, \quad \text{then}\ \ \left(m^2 n\right)^{2/3} + \left(mn^2\right)^{2/3}$ =

A. 1

B. 2

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

D. 0

Answer: A

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5. यदि $\sin x + \sin^2 x + \sin^3 x = 1$, तो सिद्ध कीजिए कि $\cos^6 x - 4\cos^4 x + 8\cos^2 x - 4 = 0$.

A. 2

B. 1

C. 3

D. 4

Answer: D

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6. If $\cot\theta + \tan\theta = m$ and $\sec\theta - \cos\theta = n$ then which of the following is correct

A. $m(mn^2)^{1/3} - n(nm^2)^{1/3} = 1$

B. $m\left(m^2n\right)^{1/3} - n\left(mn^2\right)^{1/3} = 1$

C. $n\left(mn^2\right)^{1/3} - m\left(mn^2\right)^{1/3} = 1$

D. $m\left(m^2n\right)^{1/3} - m\left(mn^2\right)^{1/3} = 1$

Answer: A

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7. If $\frac{\sin^4\theta}{a} + \frac{\cos^4\theta}{b} = \frac{1}{a+b}$, then which one ofhte following is incorrect?

A. $\frac{\sin^4\theta}{a^2} = \frac{\cos^4\theta}{b^2}$

B. $\frac{\sin^4\theta}{b^2} = \frac{\cos^4\theta}{a^2}$

C. $\sin^4\theta = \frac{a^2}{(a+b)^2}$

D. $\frac{\sin^8\theta}{a^3} + \frac{\cos^8\theta}{b^3} = \frac{1}{(a+b)^3}$

Answer: B

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8. If $x \sin\theta = y\cos\theta = \dfrac{2z\tan\theta}{1-\tan^2\theta}$, then $4z^2\left(x^2+y^2\right) =$

A. $\left(x^2+y^2\right)$

B. $\left(x^2-y^2\right)$

C. $\left(x^2-y^2\right)$

D. $\left(x^2+y^2\right)$

Answer: C

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9. If $3\cot A = -6, \sec B = -2\sqrt{10},$ where $\dfrac{\pi}{2} < A < \pi, \pi < B < \dfrac{3\pi}{2}$, then $\cos ecA - \tan B$ is equal to

A. 1

B. -1

C. $\sqrt{5}-\sqrt{39}$

D. -2

Answer: C

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10. let $0 < \phi < \frac{\pi}{2}$, $x = \sum_{n=0}^{\infty} \cos^{2n} \phi$, $y = \sum_{n=0}^{\infty} \sin^{2n} \phi$ and $z = \sum_{n=0}^{\infty} \cos^{2n} \phi \sin^{2n} \phi$

A. $xyz = xz + y$

B. $xyz = xy + z$

C. $xyz = x + yz$

D. none of these

Answer: B

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