



## MATHS

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## Trigonometric Ratios of Complementary Angle

### Exercise

1. Multiple Choice Questions (MCQ) value  $\tan 52^\circ \tan 72^\circ \tan 38^\circ \tan 18^\circ$  is

A. -1

B. 0

C. 1

D. undefine.

**Answer:**



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2. If  $\tan \theta = \cot \phi$ , then  $\tan \left[ \frac{\theta + \phi}{2} \right] =$

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

B. 1

C.  $\sqrt{3}$

D. 0

**Answer:**



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3. If alpha and beta are complementary angles, then the value of  $\sec^2 \alpha - \cot^2 \beta$  is

A. 0

B. 1

C. 44228

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

**Answer:**



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4. Value of  $[\cos(40^\circ + \theta) - \sin(50^\circ - \theta)]$  is

A. -1

B. 0

C. 1

D. 1/2.

**Answer:**



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5. If  $\alpha + \beta = 90^\circ$  and  $\cot \alpha = \frac{4}{3}$  then  $\cot \beta =$

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

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

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

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

**Answer:**



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6. If  $0^\circ < \theta < 20^\circ$  and  $\cos^2 6\theta - \cos 6\theta = 0$ , then the value of  $\theta$  is

A.  $15^\circ$

B.  $16^\circ$

C.  $17^\circ$

D.  $18^\circ$

**Answer:**



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7. If  $\tan 2\alpha = \cot 2\beta$ , then  $\sec(\alpha + \beta) =$

A. 0

B.  $\sqrt{3}$

C.  $\sqrt{2}$

D. 1

**Answer:**



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8. If  $\tan 2\theta \cdot \tan 3\theta = 1$ , then  $\sin 5\theta =$

A. 0

B. 1

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

D. none of these.

**Answer:**



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9. If  $\sec(90^\circ - \alpha) = 4 - \cos \alpha$  ( $0^\circ < \alpha < 90^\circ$ ), then the value of  $\alpha$  is

A.  $75^\circ$

B.  $60^\circ$

C.  $45^\circ$

D.  $30^\circ$

**Answer:**



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10. Calculate the slope of a line, that passes through the origin, and the mid-point of the segment joining the points P (0, -4) and B (8, 0).

A.  $1/2$

B.  $1/3$

C.  $-1/2$

D.  $-1/3$

**Answer:**



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11.  $\sin 2A = 2\sin A$  is true when  $A =$

A.  $0^\circ$

B.  $30^\circ$

C.  $45^\circ$

D.  $60^\circ$

**Answer:**



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12. It  $A + B = 90^\circ$ , then  $\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \frac{\sin^2 B}{\cos^2 A}$  is equal to\_\_\_\_

- A.  $\cot^2 A$
- B.  $\cot^2 B$
- C.  $-\tan^2 A$
- D.  $-\cot^2 A$

**Answer:**



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13. If  $\tan A = \cot B$ , then prove that  $A + B = 90^\circ$ .



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14.  $(\sin^2 22^\circ + \sin^2 68^\circ + \cot^2 68^\circ)$  equals \_\_\_

A.  $\cot^2 22^\circ \operatorname{cosec}^2 68^\circ$

B.  $\tan^2 22^\circ \operatorname{cosec}^2 68^\circ$

C.  $\operatorname{cosec}^2 68^\circ$

D. None of these.

**Answer:**



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15.  $\frac{2\tan 30^\circ}{1 - \tan^2 30^\circ}$  is equal to \_\_\_

A.  $\cos 60^\circ$

B.  $\sin 60^\circ$

C.  $\tan 60^\circ$

D.  $\sin 30^\circ$

**Answer:**



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16. If  $\theta$  and  $(2\theta - 45^\circ)$  are acute angles such that  $\sec\theta \cos(2\theta - 45^\circ) = 1$  then  $\tan\theta$  equals\_\_\_\_

A. 1

B. -1

C.  $\sqrt{3}$

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

**Answer:**



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17. A, B and C are interior angles of a triangle ABC, then  $\sin\left(\frac{B+C}{2}\right) =$

A.  $\sin A/2$

B.  $\cos A/2$

C.  $-\sin A/2$

D.  $-\cos A/2$

**Answer:**



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18. The value of  $\tan 10^\circ \tan 15^\circ 75^\circ \tan 80^\circ$  is \_\_\_

A. -1

B. 0

C. 1

D. N.O.T.

**Answer:**



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19. If  $5\theta$  and  $4\theta$  are acute angles satisfying  $\sin 5\theta = \cos 4\theta$  then  $2 \sin 3\theta - \sqrt{3} \tan 3\theta$  is equal to \_\_\_\_

A.  $1 - \sqrt{3}$

B.  $1 + \sqrt{3}$

C. 0

D. 1

**Answer:**



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20.

$$[\sin^2 1^\circ + \sin^2 2^\circ + \sin^2 3^\circ + \dots + \sin^2 87^\circ + \sin^2 88^\circ + \dots]$$

equals \_\_\_\_

A. 44

B. 44.5

C. 22

D. 22.5

**Answer:**



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**21.**

$$(\sin^2 1^\circ + \sin^2 3^\circ + \sin^2 5^\circ + \dots + \sin^2 85^\circ + \sin^2 87^\circ + \dots)$$

equals \_\_\_\_

A. 22

B. 44

C. 22.5

D. 44.5

**Answer:**



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22. The value of  $\frac{\cos(90^\circ - \theta)\sec(90^\circ - \theta)\tan \theta}{\cos ec(90^\circ - \theta)\sin(90^\circ - \theta)\cot(90^\circ - \theta)\frac{\tan(90^\circ - \theta)}{\cot \theta}}$   
is \_\_\_\_

A.  $\sin \theta$

B.  $\cos \theta$

C. 1

D. 2

**Answer:**



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23. The value of  $\frac{\tan 47^\circ + \cot 27^\circ}{\tan 43^\circ + \cot 63^\circ}$  is \_\_\_\_

A.  $\cot 47^\circ \tan 27^\circ$

B.  $\cot 47^\circ \cot 27^\circ$

C.  $\tan 47^\circ \cot 27^\circ$

D. None of these.

**Answer:**



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24.  $(1 + \sec 20^\circ + \cot 70^\circ)(1 - \csc 20^\circ + \tan 70^\circ)$  equals \_\_\_\_

A. 0

B. 1

C. 2

D. None of these.

**Answer:**



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25.  $\alpha, \beta$  are positive acute angle and  $\sec^2 \alpha - \cot^2 \left( \frac{\beta}{2} \right) = 1$ , then \_\_\_

A.  $\alpha = \beta$

B.  $\alpha + \beta = \frac{\Pi}{2}$

C.  $\alpha + 2\beta = \Pi$

D.  $2\alpha + \beta = \Pi$

**Answer:**



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26. ABCD is a cyclic quadrilateral and

$\tan \left( \frac{A}{2} \right) \tan \left( \frac{C}{2} \right) + \tan \left( \frac{B}{2} \right) \tan \left( \frac{D}{2} \right)$  equals \_\_\_\_\_



A. 1

B. 2

C. 3

D. 4

**Answer:**



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27. If  $\cos(67^\circ 30')$  =  $x$  and  $\operatorname{cosec}(22^\circ 30')$  =  $y$  then which is true?

A.  $x^2 + y^2 = 1$

B.  $x^2 - y^2 = 1$

C.  $x = y$

D.  $xy = 1$

**Answer:**



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28. If  $\operatorname{cosec} 39^\circ = x$ , the value of

$$\frac{1}{\operatorname{cosec}^2 51^\circ} + \sin^2 39^\circ + \tan^2 51^\circ - \frac{1}{\sin^2 51^\circ \sec^2 39^\circ} \text{ is } \underline{\hspace{2cm}}$$

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

B.  $\sqrt{\frac{1}{x^2}}$

C.  $x^2 - 1$

D.  $1 - x^2$

**Answer:**



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29.  $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 85^\circ + \sin^2 90^\circ$  equals

to

A. 7.5

B. 8.5

C. 9

D. 9.5

**Answer:**



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**30.** If  $A$ ,  $B$  and  $C$  are three angles of a triangle, then the incorrect relation is \_\_\_\_\_

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

B.  $\tan\left(\frac{A+B}{2}\right) = \frac{\sec c}{2}$

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

D.  $\cot\left(\frac{A+B}{2}\right) = \frac{\tan c}{2}$

**Answer:**



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