



## MATHS

### BOOKS - ARIHANT PUBLICATION JHARKHAND

### TRIGONOMETRIC RATIOS

#### Solved Examples

1. If  $\sin \theta = \frac{8}{17}$ , then the value of  $\cos \theta$  and  $\tan \theta$  is

(a)  $\frac{15}{17}, \frac{8}{15}$

(b)  $\frac{15}{8}, \frac{8}{15}$

(c)  $\frac{15}{17}, \frac{15}{8}$

(d) None of these

A.  $\frac{15}{17}, \frac{8}{15}$

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

C.  $\frac{15}{17}$

D. None of these

**Answer: A**

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2. If  $\cot A = \frac{1}{\sqrt{2} - 1}$ , then  $\sin A \cdot \cos A$  is equal to

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

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

C.  $\frac{\sqrt{2}}{4}$

D. 1

Answer: C

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## Exam Booster For Cracking Exam

1.  $\triangle ABC$  has a right angle at A. If

$BC = \sqrt{2}$  and  $AB = AC = 1$  then  $\sin B$  is equal to

(a)  $\frac{1}{\sqrt{2}}$

(b)  $\sqrt{2}$

(c)  $\frac{\sqrt{3}}{2}$

(d)  $\sqrt{3}$

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

B.  $\sqrt{2}$

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

D.  $\sqrt{3}$

**Answer: A**



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2. In  $\triangle PQR$ ,  $Q$  is a right angle,  $PQ = 3$  and  $QR = 4$ . If

$\angle P = \alpha$  and  $R = \beta$ , then  $\tan \beta$  is equal to

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

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

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

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

**Answer: B**



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3. If  $\sin B = \frac{1}{2}$ , then  $3 \cos B - 4 \cos^3 B$  is equal to

(a) 1

(b)  $\frac{3}{4}$

(c) 0

(d)  $2\frac{1}{2}$

A. 1

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

C. 0

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

**Answer: C**



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4. If  $\sec \alpha = \frac{5}{4}$  then  $\frac{\tan \alpha}{1 + \tan^2 \alpha}$  is equal to

A.  $\frac{9}{25}$

B.  $\frac{12}{25}$

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

D.  $\frac{1}{25}$

**Answer: B**



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5.

If

$\tan A = 1$  and  $\tan B = \sqrt{3}$ , evaluate  $\cos A \cos B - \sin A \sin B$ .

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

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

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

D. 1

**Answer: B**



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6. If  $3 \tan \theta = 4$ , then find  $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}}$

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

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

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

D. None of these

**Answer: C**



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7. If  $16 \cot \theta = 12$ , then  $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta}$  is equal to

A. 7

B.  $-7$

C.  $\frac{1}{7}$

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



**Answer: A**



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8. If  $\tan \theta + \frac{1}{\tan \theta} = 2$ , find the value of  $\tan^2 \theta + \frac{1}{\tan^2 \theta}$

A. 6

B. 4

C. 2

D. 3

**Answer: C**



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9. If  $\tan \theta = \frac{12}{13}$  then value of  $\frac{2 \sin \theta \cos \theta}{\cos^2 \theta - \sin^2 \theta}$  is

A.  $\frac{123}{25}$

B.  $\frac{312}{25}$

C.  $\frac{231}{25}$

D.  $\frac{192}{25}$

**Answer: B**



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10. If  $\sec \theta = \frac{13}{5}$  then  $\frac{2 \sin \theta - 3 \cos \theta}{4 \sin \theta - 9 \cos \theta}$  is equal to

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

B.  $-3$

C. 3

D. 2

**Answer: C**



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11. The value of  $x$ , if  $x \cos^2 45^\circ - \sec^2 60^\circ + \sin^2 30^\circ = \frac{1}{8}$ ,  
is

A. 31

B. 32

C.  $\frac{31}{4}$

D. None of these

**Answer: C**



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12. If  $\sqrt{3} \tan 2\theta - 3 = 0$  then  $\theta =$

A.  $30^\circ$

B.  $60^\circ$

C.  $90^\circ$

D. None of these

**Answer: A**



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13. If  $\tan(A - B) = \frac{1}{\sqrt{3}}$  and  $\tan(A + B) = \sqrt{3}$ . then

the values of A and B are

A.  $45^\circ, 15^\circ$

B.  $40^\circ, 20^\circ$

C.  $30^\circ, 60^\circ$

D. None of these

**Answer: A**



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14. If  $\sqrt{2} \sin(60^\circ - \theta) = 1$ , then the value of  $\theta$  is

A.  $20^\circ$

B.  $30^\circ$

C.  $15^\circ$

D. None of these

**Answer: C**



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**15.** ABC is a right angled triangle, right angled at C. If  $\angle A = 60^\circ$  and  $AB = 40$  unit, then the length of AC is

A. 30 unit

B. 20 unit

C. 40 unit

D. None of these

**Answer: B**



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**16.** In a rectangle ABCD,  $AB = 15 \text{ cm}$   $\angle BAC = 60^\circ$  then BC is equal to

A.  $15\sqrt{2} \text{ cm}$

B.  $15 \text{ cm}$

C.  $15\sqrt{5} \text{ cm}$

D.  $15\sqrt{3} \text{ cm}$

**Answer: D**



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17. The altitude  $AD$  of a  $ABC$ , in which  $\angle A$  obtuse and,  $AD = 10\text{cm}$ . If  $BD = 10\text{cm}$  and  $CD = 10\sqrt{3}\text{cm}$ , determine  $\angle A$ .

A.  $60^\circ$

B.  $30^\circ$

C.  $105^\circ$

D. None of these

**Answer: C**

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18. If a rhombus of side 10 cm has two angles of  $60^\circ$  each. Then the length of diagonals ( in cm) are



A.  $10\sqrt{3}$ , 10

B.  $10\sqrt{2}$ , 10

C. 5, 10

D. None of these

**Answer: A**

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**19.** If  $\cos 2x = \cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ$ , then the value of  $x$  is

A.  $15^\circ$

B.  $40^\circ$

C.  $30^\circ$

D. None of these

**Answer: A**



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20. If  $3 \sec A - 2 \cos B = \sqrt{3}$  and  $\angle B = 30^\circ$ , then the value of  $\cos(A - B)$  is

A. 1

B. 2

C. 3

D. 0

**Answer: A**





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21. The value of

$$\frac{\tan^2 60^\circ + 4 \sin^2 45^\circ + 3 \sec^2 30^\circ + 5 \cos^2 90^\circ}{\operatorname{cosec} 30^\circ + \sec 60^\circ - \cot^2 30^\circ} \text{ is}$$

A. 5

B. 3

C. 9

D. 2

**Answer: C**



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22. If  $\sin \theta = -\frac{12}{13}$  and  $\pi < \theta < \frac{3\pi}{2}$ , then the value of  $\sec \theta$  is

A.  $\frac{13}{5}$

B.  $-\frac{13}{5}$

C.  $-\frac{12}{13}$

D. None of these

**Answer: B**

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23. If  $\sin \theta = \frac{5}{13}$ , then the values of  $\tan \theta$  and  $\sec \theta$  respectively, are

A.  $\frac{5}{12}, \frac{13}{12}$

B.  $\frac{11}{13}, \frac{5}{12}$

C.  $\frac{14}{19}, \frac{5}{12}$

D.  $\frac{5}{13}, \frac{5}{12}$

**Answer: A**



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**24.** The value of

$$\frac{\cos(90^\circ + A)\sec(360^\circ - A)\tan(180^\circ - A)}{\sec(A - 720^\circ)\sin(540^\circ + A)\cot(A - 90^\circ)}$$
 is

A. 0

B. 1

C.  $\infty$

D. None of these

**Answer: B**



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25. If  $\tan \theta + \sin \theta = m$  and  $\tan \theta - \sin \theta = n$ , then find the value of  $m^2 - n^2$ .

A.  $4\sqrt{mn}$

B.  $\sqrt{mn}$

C.  $2\sqrt{mn}$

D. None of these

**Answer: A**





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