MATHS

BOOKS - OSWAL PUBLICATION

INTRODUCTION TO TRIGONOMETRY AND TRIGONOMETRIC IDENTITIES

Stand Alone Mcqs

1. If cos A=$\frac{4}{5}$, then the value of tanA is

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

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

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

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

Answer: B

Watch Video Solution

2. If $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to

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

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

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

D. $\frac{a}{\sqrt{b^2 - a^2}}$

Answer: C

Watch Video Solution

3. If $\cos 9\alpha = \sin\alpha$ and $9\alpha < 90^\circ$, then the value of $\tan 5\alpha$ is

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

B. $\sqrt{3}$

C. 1

D. 0

Answer: C

Watch Video Solution

4. If ΔABC is right angled at C, then the value of cos(A+B) is

A. 0

B. 1

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

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

Answer: A

Watch Video Solution

5. If $\sin\alpha = \frac{1}{2}$ and $\cos\beta = \frac{1}{2}$, then the value of $(\alpha + \beta)$ is

A. 0°

B. 30°

C. 60°

D. 90°

Answer: D

Watch Video Solution

6. If $4\tan\theta=3$, then $\left(\frac{4\sin\theta-\cos\theta}{4\sin\theta-\cos\theta}\right)$ is equal to

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

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

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

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

Answer: C

Watch Video Solution

7. If $\sin\theta - \cos\theta = 0$,then the value of $\sin^4\theta + \cos^4\theta$ is

A. 1

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

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

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

Answer: C

Watch Video Solution

8. v20

A. $\tan 90^\circ$

B. 1

C. $\sin 45^\circ$

D. 0

Answer: D

Watch Video Solution

9. $9\sec^2 A - 9\tan^2 A =$

A. 1

B. 9

C. 8

D. 0

Answer: B

Watch Video Solution

10. The value of $[(\sec A + \tan A)(1 - \sin A)]$ is equal to $\tan^2 A (b) \sin^2 A$

(c) $\cos A$ (d) $\sin A$

A. sec A

B. sin A

C. $\operatorname{cosec} A$

D. cos A

Answer: D

Watch Video Solution

11. Write the value of $\left(1 - \sin^2 \theta\right) \sec^2 \theta$.

A. 1

B. 0

C. 2

D. 3

Answer: A

Watch Video Solution

12. If $\cos A + \cos^2 A = 1$, then $\sin^2 A + \sin^4 A$ is equal to

A. 2

B. 1

C. 3

D. 4

Answer: B

Watch Video Solution

13. The value of $(\text{cosec}\theta - \cot\theta)^2$ is

A. $\frac{1+\cos\theta}{1-\cos\theta}$

B. $\frac{1+\sin\theta}{1-\sin\theta}$

C. $\frac{1-\cos\theta}{1+\cos\theta}$

D. None of these

Answer: C

Watch Video Solution

14. Evaluate: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$.

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

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

C. $\text{cosec}\ \theta-\cot\theta$

D. $\text{cosec}\ \theta+\cot\theta$

Answer: A

Watch Video Solution

Watch Video Solution

15. Prove that

$\sqrt{\sec^2\theta + \text{cosec}^2\theta} = \tan\theta + \cot\theta.$

A. $\tan\theta - \cot\theta$

B. $\tan\theta + \cot\theta$

C. $\sec\theta + \quad \text{cosec}\theta$

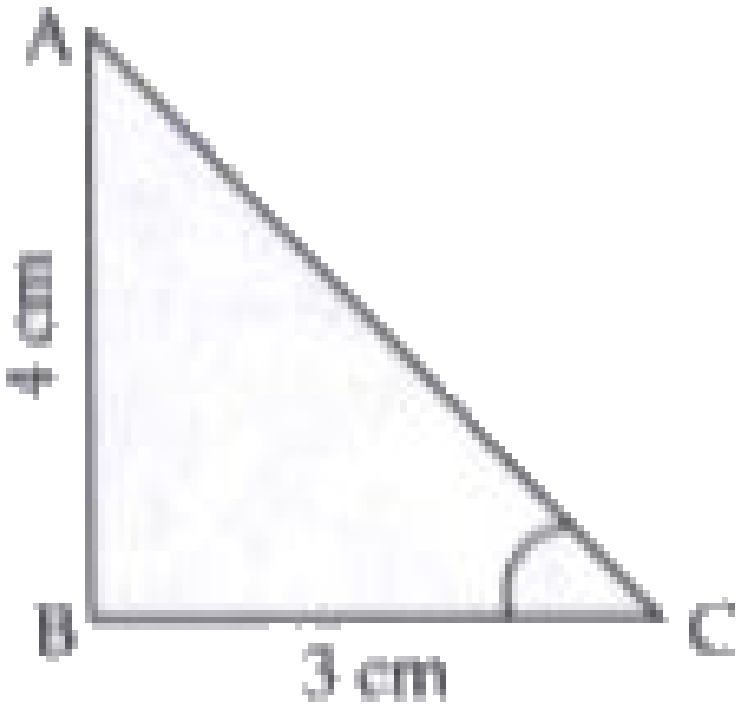
D. None of these

Answer: B

Watch Video Solution

Assertion And Reason Based Mcqs

1. Assertion (A) : In figure given below ,AC = 5 cm



Reason (R) : $\sin 60^\circ = \frac{\sqrt{3}}{2}$

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: B

Watch Video Solution

2. Assertion (A) : $\sin 0^\circ = 0 \text{ and } \sin 90^\circ = 1$

Reason (R) : The value of sin A can exceed 1

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: C

Watch Video Solution

3. Assertion (A) : In ΔABC , right angled at C and $\angle A = \angle B$ then cos A = cos B .

Reason (R) : In a triangle , equal opposite sides have equal opposite angles .

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: A

Watch Video Solution

4. Assertion (A) : Value of $\sec^2 10^\circ - \cot^2 80^\circ$ is 1

Reason (R) : Value of $\sin 30^\circ = \frac{1}{2}$

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: B

Watch Video Solution

5. If $\cos A + \cos^2 A = 1$, then prove that $\sin^2 A + \sin^4 A = 1$.

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: D

Watch Video Solution

6. Assertion (A) : $\sin^2 67^\circ + \cos^2 67^\circ = 1$

Reason (R) : For any value of θ, $\sin^2 \theta + \cos^2 \theta = 1$

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: A

Watch Video Solution

7. Assertion (A) : $\left(\frac{1+\cos\theta}{\sin\theta}\right)^2 = \frac{1+\cos\theta}{1-\cos\theta}$

Reason (R) : $\sin^2\theta = \cos^2\theta - 1$

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is NOT the correct explanation of A.

C. A is true but R is false

D. A is false but R is true

Answer: C

Watch Video Solution

Case Based Mcqs I

1. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. What should be the length of the ladder that she should use which, when inclined at

A. 3.7 m

B. 5 m

C. 6.3 m

D. 1.3 m

Answer: A

Watch Video Solution

2. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. What should be the length of the ladder that she should use which, when inclined at

A. 18 m

B. 8 m

C. $\frac{13}{5}$ m

D. 12 m

Answer: D

Watch Video Solution

3. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the

repair work. What should be the length of the ladder that she should use which, when inclined at

A. $\frac{\text{Base}}{\text{Hypptenuse}}$

B. $\frac{\text{Perpendicular}}{\text{Hypotenuse}}$

C. $(Hypotevse)/(Base)$

D. $\frac{\text{Perpendicular}}{\text{Base}}$

Answer: B

Watch Video Solution

4. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. What should be the length of the ladder that she should use which, when inclined at

A. 0

B. 1

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

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

Answer: D

Watch Video Solution

5. An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3m below the top of the pole to undertake the repair work. What should be the length of the ladder that she should use which, when inclined at

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

B. 1

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

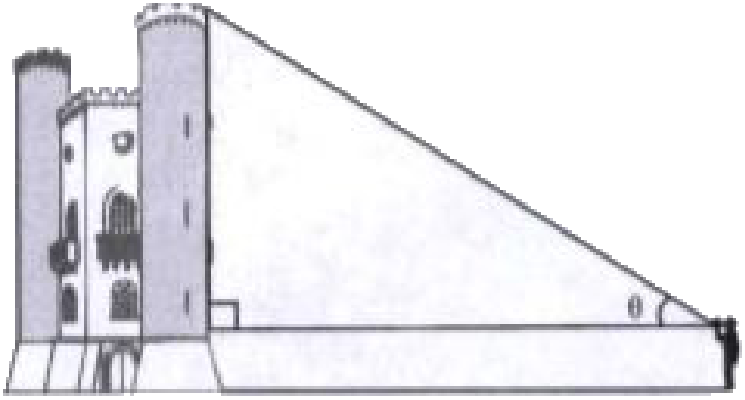
D. $\sqrt{3}$

Answer: D

Watch Video Solution

Case Based Mcqs Ii

1. Suppose a girl is sitting on the balcony of her house located on the bank of river. She is looking down at a flower pot placed on a stair of a temple situated nearly on other bank of the river. A right triangle is imagined to be made in this situation as shown in figure.



If height of her house is 12 m , and the distance between her house and the river is 5 m , then what will be value of $\sin\theta$?

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

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

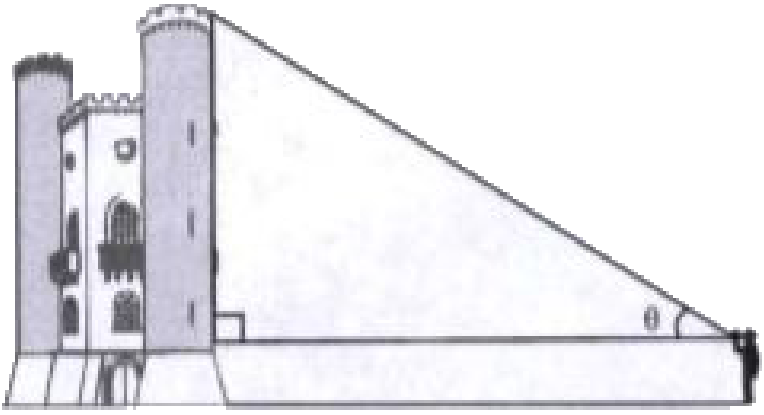
C. $\frac{12}{5}$

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

Answer: A

Watch Video Solution

2. Suppose a girl is sitting on the balcony of her house located on the bank of river. She is looking down at a flower pot placed on a stair of a temple situated nearly on other bank of the river. A right triangle is imagined to be made in this situation as shown in figure.



If width of the river is 15 m , and angle of depression of flower pot from balcony is 60° , then what will be height of the building ?

A. $15\sqrt{3}$ m

B. $15\sqrt{2}$m

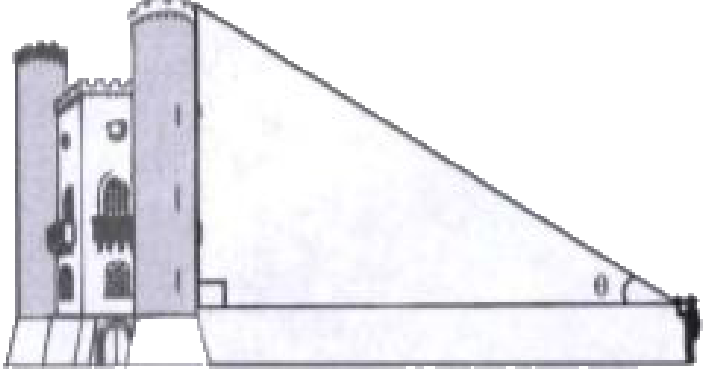
C. $10\sqrt{2}$m

D. $10\sqrt{3}$m

Answer: A

Watch Video Solution

3. Suppose a girl is sitting on the balcony of her house located on the bank of river. She is looking down at a flower pot placed on a stair of a temple situated nearly on other bank of the river. A right triangle is imagined to be made in this situation as shown in figure.



The angle between foot of the building and river is . . . . . .

A. 60°

B. 45°

C. 30°

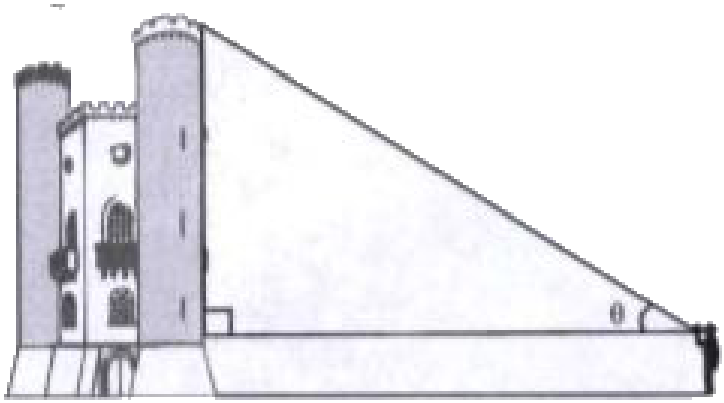
D. 90°

Answer: D

Watch Video Solution

4. Suppose a girl is stitting on the balocny of her house located on the bank of river. She is looking down at a flower pot placed on a stair of a temple situated nearly on other bank of the river. A right triangle is

imagined to be made in this situation as shown in figure.



Value of sin 60° is .....

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

B. 1

C. 0

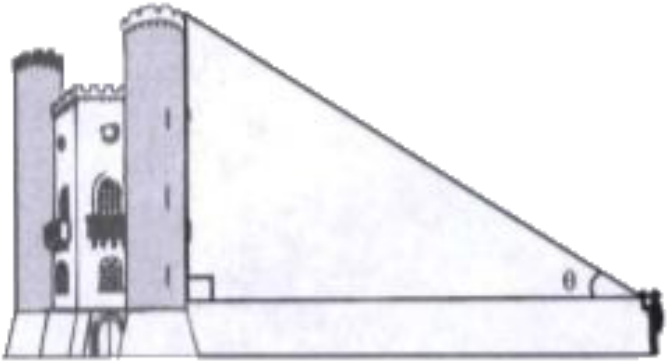
D. $\frac{\sqrt{3}}{2}$

Answer: D

Watch Video Solution

5. Suppose a girl is stitting on the balocny of her house located on the bank of river. She is looking down at a flower pot placed on a stair of a temple situated nearly on other bank of the river. A right triangle is imagined to be made in this situation as shown in figure.

Write the value of sin 30°



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

B. 0

C. 1

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

Answer: A

Watch Video Solution

Case Based Mcqs Iii

1. If $\cot\theta = \frac{7}{8}$

Find the Value of $\cot^2\theta$

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

B. $\frac{49}{64}$

C. $\frac{56}{78}$

D. $\sqrt{\frac{7}{8}}$

Answer: B

Watch Video Solution

2. If $\cot\theta = \frac{7}{8}$

Find the value of $\sin\theta$

A. $\frac{8}{113}$

B. $\frac{7}{\sqrt{113}}$

C. $\frac{8}{\sqrt{113}}$

D. $\frac{6}{\sqrt{113}}$

Answer: C

Watch Video Solution

3. If $\cot\theta = \frac{7}{8}$ .Find the value of $\cos\theta$

A. $\frac{8}{113}$

B. $\frac{7}{\sqrt{113}}$

C. $\frac{8}{\sqrt{113}}$

D. $\frac{6}{\sqrt{113}}$

Answer: B

Watch Video Solution

4. If $\cot\theta = \frac{7}{8}$ then find the value $\frac{(1-\sin\theta)(1+\sin\theta)}{(1-\cos\theta)(1+\cos\theta)}$

A. $\frac{64}{49}$

B. 1

C. $\frac{49}{64}$

D. none of these

Answer: C

Watch Video Solution

5. If $\cot\theta = \frac{7}{8}$

Find the value of $\sin^2\theta + \cos^2\theta$.

A. 1

B. 0

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

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

Answer: A

Watch Video Solution

Example

1. Evaluate : $\frac{5\cos^2 60^\circ + 4\cos^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 60^\circ}$

Watch Video Solution

2. Prove the following trigonometric identities:

$\cot\theta - \tan\theta = \frac{2\cos^2\theta - 1}{\sin\theta\cos\theta}$

Watch Video Solution

Self Assessment 1 I Objective Type Questions A Multiple Choice Questions

1. If triangle ABC is right angled at C, then the value of sec (A+B) is

A. 0

B. 1

C. $2\sqrt{3}$

D. not defined

Answer:

Watch Video Solution

2. If $\sin\theta + \cos\theta = \sqrt{2}\cos\theta, (\theta \neq 90^\circ)$ then value of $\tan\theta$ is

A. $\sqrt{2} - 1$

B. $\sqrt{2} + 1$

C. $\sqrt{2}$

D. $-\sqrt{2}$

Answer:

Watch Video Solution

3. Given that $\sin\alpha = \frac{\sqrt{3}}{2}$ and $\cos\beta = 0$, then the value of $\beta - \alpha$ is

A. 0°

B. 90°

C. 60°

D. 30°

Answer:

Watch Video Solution

Self Assessment 1 I Objective Type Questions B Fill In The Blanks

1. Value of $\cos 0^\circ . \cos 30^\circ . \cos 45^\circ . \cos 60^\circ . \cos 90^\circ$ is _____.

Watch Video Solution

2. Value of $(\sin 30^\circ + \cos 30^\circ) - (\sin 60^\circ + \cos 60^\circ)$ is ____

Watch Video Solution

Self Assessment 1 I Objective Type Questions C Very Short Answer Type Questions

1. If $\sin \theta = \cos \theta$, then find the value of $2 \tan \theta + \cos^2 \theta$.

Watch Video Solution

2. If $\tan(3x + 30^\circ) = 1$ then find the value of x

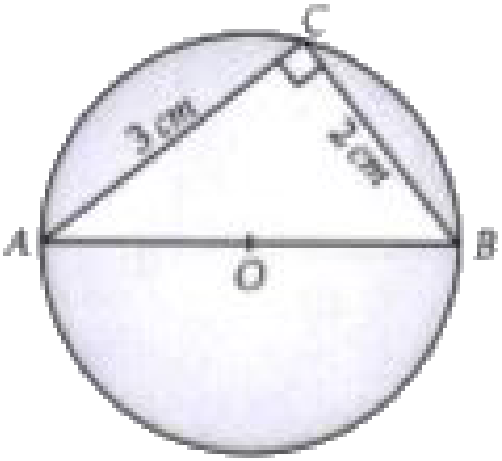
Watch Video Solution

3. If $\sec\theta.\ \sin\theta = 0$, then find the value of θ.

Watch Video Solution

Self Assessment 1 Ii Short Answer Type Questions I

1. In the given figure, AOB is a diameter of a circle with centre O. Find tan A tan B.



Watch Video Solution

Self Assessment 1 Iii Short Answer Type Questions Ii

1. Find acute angles $AandB$, if $\sin(A+2B)=\frac{\sqrt{3}}{2}and\cos(A+4B)=0, A>B.$

Watch Video Solution

2. If in a triangle ABC right angled at B, AB = 6 units and BC = 8 units, then find the value of sin A. cos C + cos A. sin C.

Watch Video Solution

3. If $4\tan\theta=3$, evaluate $\left(\frac{4\sin\theta-2\cos\theta+3}{4\sin\theta+2\cos\theta-5}\right)$

Watch Video Solution

Self Assessment 1 Iv Long Answer Type Questions

1. Evaluate :

$$\tan^2 30^\circ \sin^2 30^\circ + \cos 60^\circ \sin^2 90^\circ \tan^2 60^\circ - 2\tan 45^\circ \cos^2 0^\circ \sin 90^\circ$$

Watch Video Solution

2. Evaluate :

$$\sin^2 30^\circ \cos^2 45^\circ + 4\tan^2 30^\circ + \frac{1}{2}\sin^2 90^\circ - 2\cos^2 90^\circ + \frac{1}{24}$$

Watch Video Solution

3. What is the value of $4\left(\sin^4 30^\circ + \cos^4 60^\circ\right) - 3\left(\cos^2 45^\circ - \sin^2 90^\circ\right)$?

Watch Video Solution

Self Assessment 2 I Objective Type Questions A Multiple Choice Questions

1. Find the value of $\frac{\sin^4\theta + \cos^4\theta}{1 - 2\sin^2\theta\cos^2\theta}$

A. 1

B. -1

C. -2

D. 2

Answer:

Watch Video Solution

2. $\sqrt{\frac{1-\cos A}{1+\cos A}} =$

A. $\text{cosec}A + \cot A$

B. $\text{cosec}A - \cot A$

C. $\text{cosec}A \cot A$

D. $-\text{cosec}A.\cot A$

Answer:

Watch Video Solution

3. $\sqrt{(1-\cos^2\theta)\sec^2\theta}\ [\because \sin^2\theta+\cos^2\theta=1]$

$=\sqrt{\sin^2\theta\frac{.1}{\cos^2\theta}}=\sqrt{\tan^2\theta}=\tan\theta$

$\left[\because \sec\theta=\frac{1}{\cos\theta}, \tan\theta=\frac{\sin\theta}{\cos\theta}\right]$

A. $\sec\theta$

B. $\tan\theta$

C. $\sin\theta$

D. $\sec^2\theta$

Answer:

Watch Video Solution

Self Assessment 2 I Objective Type Questions B Fill In The Blanks

1. Prove that : $1+\frac{\cot^2\alpha}{1+\operatorname{cosec}\alpha}=\operatorname{cosec}\alpha$

Watch Video Solution

2. If $\sin A=\frac{\sqrt{3}}{2}$ then the value $2\cot^2 A-1$ is _____

Watch Video Solution

3. If θ be an acute angle and $5\operatorname{cosec}\theta=7$, then value of $\sin\theta+\cos^2\theta$ - 1 =

_____

Watch Video Solution

Self Assessment 2 I Objective Type Questions C Very Short Answer Type Questions

1. Write the value of $\cot^2\theta-\frac{1}{\sin^2\theta}$.

Watch Video Solution

2. If $\cos A = \frac{2}{5}$, find the value of $4 + 4\tan^2 A$.

Watch Video Solution

3. If $k + 1 = \left(\sec^2 \theta\right)(1 + \sin\theta)(1 - \sin\theta)$, then find the value of k

Watch Video Solution

Self Assessment 2 I Objective Type Questions Ii Short Answer Type Questions I

1. Express the trigonometric ratio of sec A and tan A in terms of sin A.

Watch Video Solution

2. $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

Watch Video Solution

3. Prove that $\frac{1+\tan^4\theta}{1+\tan^2\theta} = \sec^2\theta - 2\sin^2\theta$

Watch Video Solution

Self Assessment 2 I Objective Type Questions Iii Short Answer Type Questions Ii

1. Prove that : $\frac{\tan A + \sin A}{\tan A - \sin A} = \frac{\sec A + 1}{\sec A - 1}$

Watch Video Solution

2. Prove that : $\frac{\cos A}{1+\tan A} - \frac{\sin A}{1+\cot A} = \cos A - \sin A$

Watch Video Solution

Self Assessment 2 I Objective Type Questions Iv Long Answer Type Questions Ii

1. Prove that $\frac{\tan^2 A}{\tan^2 A - 1} + \cos ec^2 \frac{A}{\sec^2 A - \cos ec^2 A} = \frac{1}{1 - 2\cos^2 A}$

Watch Video Solution

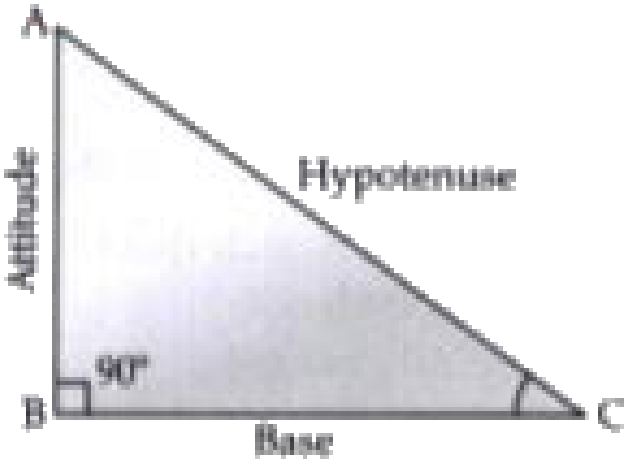
2. Prove that : $\sqrt{\frac{\sec\theta - 1}{\sec\theta + 1}} + \sqrt{\frac{\sec\theta + 1}{\sec\theta - 1}} = 2\text{cosec}\theta$

Watch Video Solution

3. If $\cos ec\theta + \cot\theta = p$, then $\cos\theta =$

Watch Video Solution

Self Assessment 2 I Objective Type Questions Vi Case Study Based Questions



1.

ΔABC is a right triangle, right angled at B. $\angle C$ is a given acute angle. So side BC is base, a side AB is altitude and side AC is hypotenuse for given acute angle C.

Find the ratio of sin C.

A. $\frac{\text{Altitude}}{\text{Hypotenuse}}$

B. $\frac{\text{Hypotenuse}}{\text{Altitude}}$

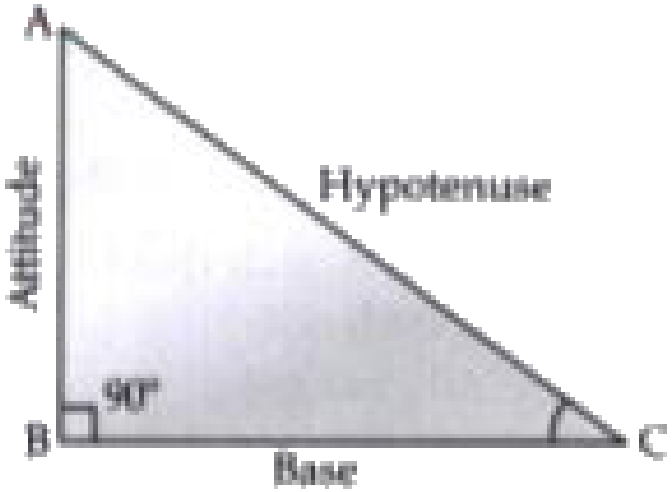
C. $\frac{\text{Base}}{\text{Altitude}}$

D. $\frac{\text{Hypotenuse}}{\text{Base}}$

Answer: A

Watch Video Solution

Watch Video Solution



2.

ΔABC is a right triangle, right angled at B. $\angle C$ is a given acute angle. So side BC is base, a side AB is altitude and side AC is hypotenuse for given acute angle C.

Find the ratio of secant of $\angle C$

A. $\frac{\text{Altitude}}{\text{Hypotenuse}}$

B. $\frac{\text{Base}}{\text{Hypotenuse}}$

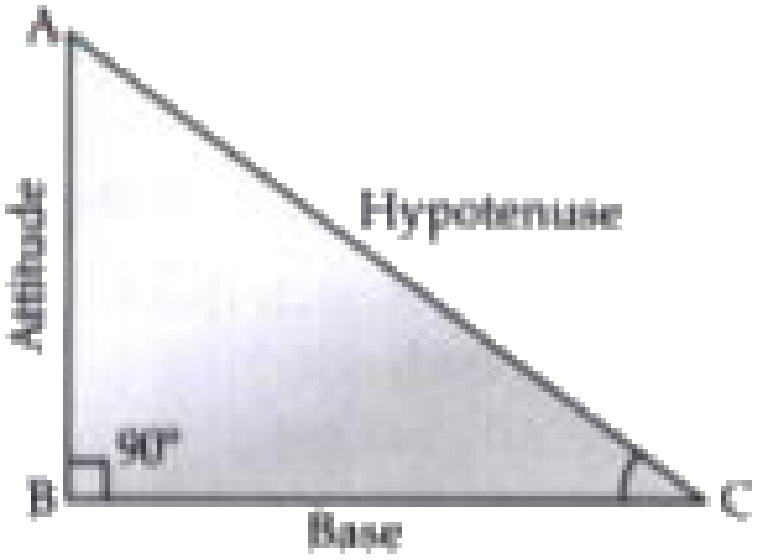
C. $\frac{\text{Hypotenuse}}{\text{Base}}$

D. $\frac{\text{Base}}{\text{Altitude}}$

Answer: C

Watch Video Solution

3.



ΔABC is a right triangle, right angled at B. $\angle C$ is a given acute angle. So side BC is base, a side AB is altitude and side AC is hypotenuse for given acute angle C.

$\frac{\text{Base}}{\text{Altitude}}$ is equal to _____

A. tan C

B. cot C

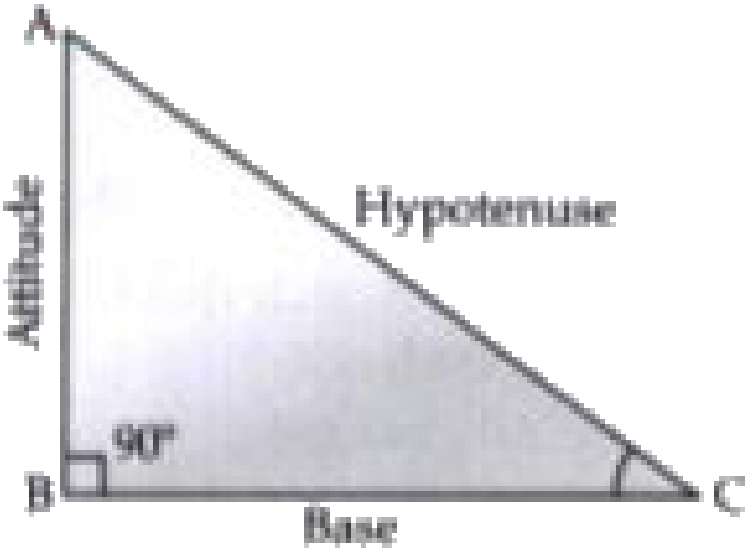
C. sin C

D. cosec C

Answer: B

Watch Video Solution

4.



ΔABC is a right triangle, right angled at B. $\angle C$ is a given acute angle. So side BC is base, a side AB is altitude and side AC is hypotenuse for given acute angle C.

$\frac{\text{Hypotenuse}}{\text{Altitude}}$ is equal to _____

A. tan C

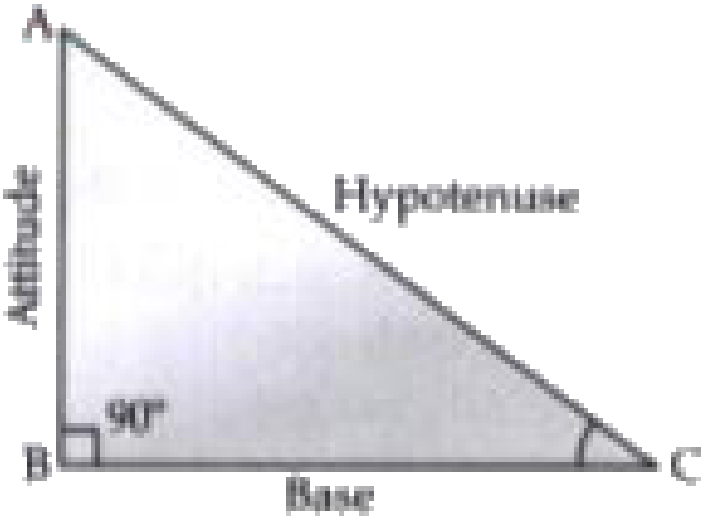
B. sin C

C. sec C

D. cosec C

Answer: D

Watch Video Solution



5.

$\triangle ABC$ is a right triangle, right angled at B. $\angle C$ is a given acute angle.

So side BC is base, a side AB is altitude and side AC is hypotenuse for given acute angle C. The ratio $\frac{BC}{AC}$ is equal to _____

A. cos C

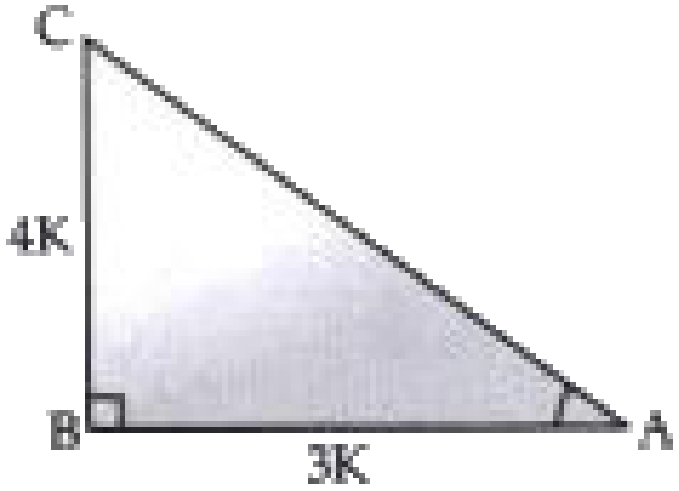
B. tan C

C. cosec C

D. sin C

Answer: A

Watch Video Solution



6.

ΔABC is a right triangle , right angle at B . Given the ratio of altitude and base $\tan A = \frac{4}{3}$. Find the value of AC

A. 3 K

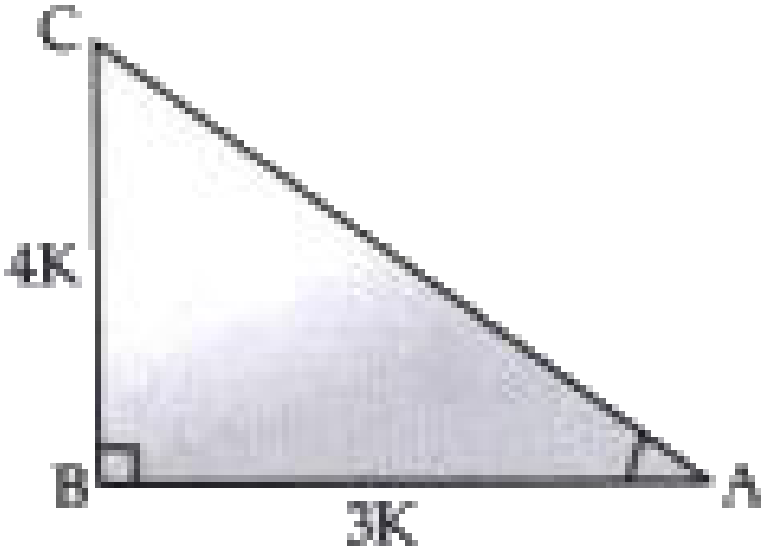
B. 5 K

C. 4 K

D. 6 K

Answer: B

Watch Video Solution



7.

$\triangle ABC$ is a right triangle , right angle at B . Given the ratio of altitude and base $\tan A = \frac{4}{3}$. Find the ratio of sin A

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

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

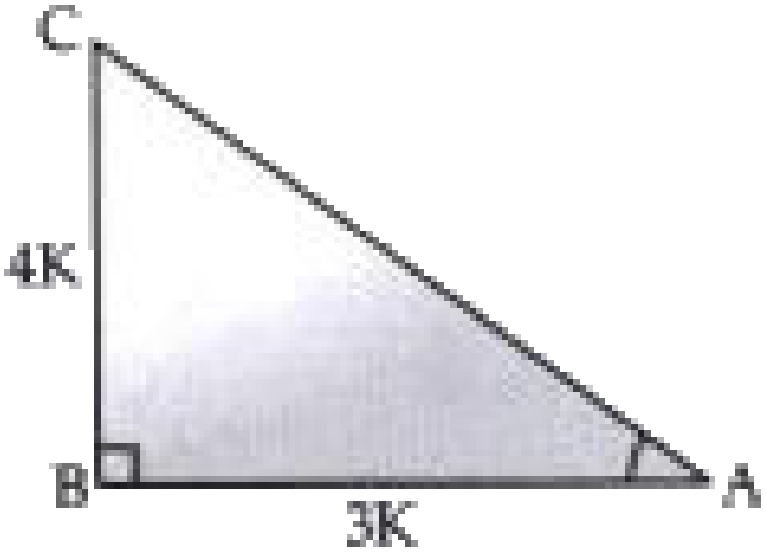
C. $\frac{3}{5}$

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

Answer: A

Watch Video Solution

8.



ΔABC is a right triangle , right angle at B . Given the ratio of altitude and base $\tan A = \frac{4}{3}$ .Find the value of $\sin A \times \tan A$

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

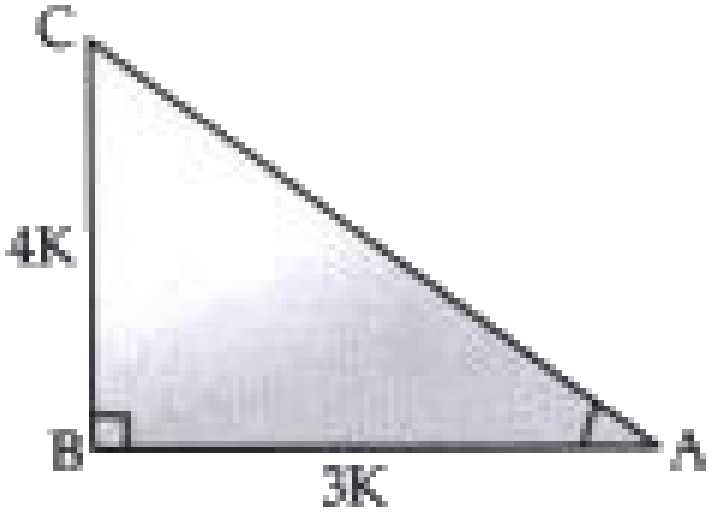
B. $\frac{15}{16}$

C. $\frac{16}{25}$

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

Answer: D

Watch Video Solution



9.

$\triangle ABC$ is a right triangle , right angle at B . Given the ratio of altitude and base $\tan A = \frac{4}{3}$. Find the value of $\left(1 + \tan^2 A\right)$

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

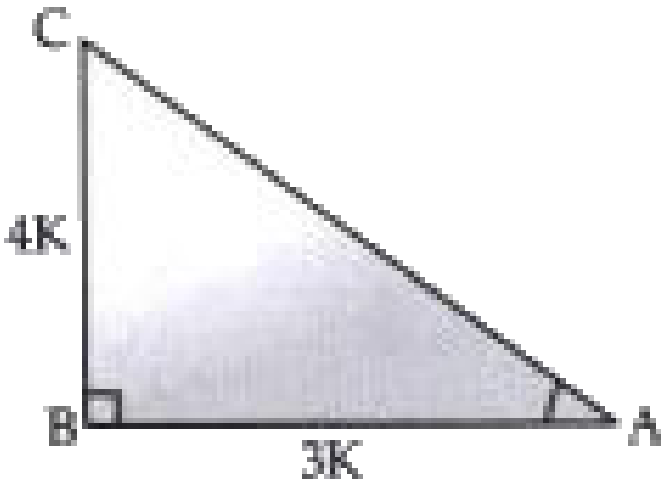
B. $\frac{9}{25}$

C. $\frac{16}{25}$

D. $\frac{25}{16}$

Answer:

Watch Video Solution



10.

$\triangle ABC$ is a right triangle , right angle at B . Given the ratio of altitude and base $\tan A = \frac{4}{3}$.Find the value of cot A .

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

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

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

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

Answer:

Watch Video Solution

11. In PQR , right-angled at Q, $PQ = 3cm$ and $PR = 6cm$. Determine $\angle P$ and $\angle R$.

A. 30°

B. 60°

C. 45°

D. 90°

Answer:

Watch Video Solution

12. In PQR , right-angled at Q, $PQ = 3cm$ and $PR = 6cm$. Determine $\angle P$ and $\angle R$.

A. 30°

B. 45°

C. 60°

D. 90°

Answer:

Watch Video Solution

13. In ΔPQR right angled at Q , PQ = 3 cm and PR = 6 cm .

Determine side QR.

A. $\sqrt{3}$ cm

B. $2\sqrt{3}$ cm

C. 6 cm

D. $3\sqrt{3}$ cm

Answer:

Watch Video Solution

14. In ΔABC , $\angle A$ is right - angled . If AB= 1 cm , AC =3 cm and BC = $\sqrt{10}$ cm , then find the values of cos B and sin C.

A. 0

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

C. 1

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

Answer:

Watch Video Solution

15. The value of $\frac{2\tan 30^\circ}{1-\tan^2 30^\circ}$ is :

A. $2\sqrt{3}$

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

C. $\sqrt{3}$

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

Answer:

Watch Video Solution

Ncert Corner Textbook Questions Exercise 8 1

1. In ΔABC , right - angled at B , AB = 24 cm , BC = 7 cm .

$\sin A, \cos A$

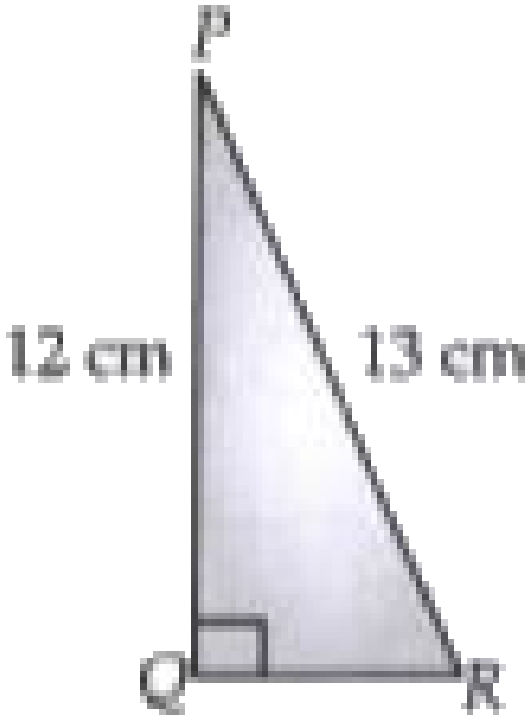
Watch Video Solution

2. In ΔABC , right - angled at B , AB = 24 cm , BC = 7 cm .

$\sin C, \cos C$

Watch Video Solution

3. In given figure , find $\tan P - \cot R$.



Watch Video Solution

4. If $s \in A = \frac{3}{4}$, calculate cos A and tan A.

Watch Video Solution

5. Given $15 \cot A = 8$, find $\sin A$ and $\sec A$.

Watch Video Solution

6. Given $\sec \theta = \frac{13}{12}$, calculate all other trigonometric ratios.

Watch Video Solution

7. If $\angle A$ and $\angle B$ are acute angles such that cos A= cos B, then show then show that $\angle A = \angle B$.

Watch Video Solution

8. If $\cot \theta = \frac{7}{8}$, evaluate:(i) $\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$ (ii) $\cot^2\theta$

Watch Video Solution

9. If $\cot\theta = \frac{7}{8}$, evaluate :

$\cot^2\theta$

Watch Video Solution

10. If $3\cot A = 4$, check whether $\frac{1-\tan^2 A}{1+\tan^2 A} = \cos^2 A - \sin^2 A$or not.

Watch Video Solution

11. In triangle ABC, right-angled at B. if $\tan A = \frac{1}{\sqrt{3}}$,find the value of:

$\sin A\cos C + \cos A\sin C$

Watch Video Solution

12. In triangle ABC, right-angled at B. if $\tan A = \frac{1}{\sqrt{3}}$,find the value of:

$\sin A\cos C + \cos A\sin C$

Watch Video Solution

13. In ΔPQR , right - angled at Q , PR +QR = 25 cm and PQ = 5cm .

Determine the values of sin P , cos P and tan P.

Watch Video Solution

14. State whether the following are true or false. Justify your Solution.

The value of tan A is always less than 1.

Watch Video Solution

15. State whether the following are true or false. Justify your Solution.

$\sec = \frac{12}{5}$ for some value of angle A.

Watch Video Solution

16. State whether the following are true or false. Justify your Solution.

cos A is the abbreviation used for the cosecant of angle A.

Watch Video Solution

17. State whether the following are true or false. Justify your Solution.

cot A is the product of cot and A.

Watch Video Solution

18. State whether the following are true or false. Justify your Solution.

$\sin\theta = \frac{4}{3}$ for some angle θ.

Watch Video Solution

Ncert Corner Textbook Questions Exercise 8 2

1. Evalulate the following :

$\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$

Watch Video Solution

2. Find the value of $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$.

Watch Video Solution

3. Evaluate : $\frac{\cos 45^\circ}{\sec 30^\circ + \text{cosec} \ \ 30^\circ}$

Watch Video Solution

4. Evaulate : $4 - \frac{\sin 30^\circ + \tan 45^\circ - \text{cosec}60^\circ}{\sec 30^\circ + \cos 60^\circ + \cos 45^\circ}$

Watch Video Solution

5. Evaluate : $\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$

Watch Video Solution

6. Choose the correct option and justify your choice : (i) $\frac{2\tan 30o}{1+\tan^2 30o} =$

$(a)\ \ s \in \ \ 60o\,(b)\ \ \cos \ \ 60o\,(c)\ \ tan\ \ 60o \qquad (d)\ \ s \in \ \ 30o$

(ii) $\frac{1-\tan^2 45o}{1+\tan^2 45o} =$ `(a)"\ "t a

A. $\sin 60^\circ$

B. $\cos 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: A

Watch Video Solution

7. v20

A. $\tan 90^\circ$

B. 1

C. $\sin 45^\circ$

D. 0

Answer: D

Watch Video Solution

8. Choose the correct option and justify your choice.

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

A. 0°

B. 30°

C. 45°

D. 60°

Answer: A

Watch Video Solution

9. Choose the correct option and justify your choice : (i) $\frac{2\tan 30o}{1+\tan^2 30o} =$

$(a)\ \ s\in\ \ 60o\,(b)\ \ \cos\ \ 60o\,(c)\ \ tan\ \ 60o \qquad (d)\ \ s\in\ \ 30o$

(ii) $\frac{1-\tan^2 45o}{1+\tan^2 45o} =$ `(a)"\ "t a

A. $\cos 60^\circ$

B. $\sin 60^\circ$

C. $\tan 60^\circ$

D. $\sin 30^\circ$

Answer: C

Watch Video Solution

10. If $\tan(A+B)=\sqrt{3}$ and $\tan(A-B)=\frac{1}{\sqrt{3}}, 0^\circ < A+B \leq 90^\circ, A > B$, find A and B .

Watch Video Solution

11. State whether the following are true or false. Justify your answer. (i) $s \in (A+B) = \sin A + s \in B$. (ii) The value of $\sin\theta$ increases as θ increases. (iii) The value of $\cos\theta$ increases as θ increases. (iv) $\sin\theta = \cos\theta$ for all v

Watch Video Solution

12. State whether the following are true or false. Justify your answer. (i) $s \in (A+B) = \sin A + s \in B$. (ii) The value of $\sin\theta$ increases as θ increases. (iii) The value of $\cos\theta$ increases as θ increases. (iv) $\sin\theta = \cos\theta$ for all v

Watch Video Solution

13. State whether the following are true or false. Justify your answer. (i) $s \in (A+B) = \sin A + s \in B$. (ii) The value of $\sin\theta$ increases as θ increases. (iii) The value of $\cos\theta$ increases as θ increases. (iv) $\sin\theta = \cos\theta$ for all v

Watch Video Solution

14. state True or false and jastify $\sin\theta = \cos\theta$ for all values of θ.

Watch Video Solution

15. State whether the following are true or false. Justify your answer. (i) $s \in (A+B) = \sin A + s \in B$. (ii) The value of $\sin\theta$ increases as θ increases. (iii) The value of $\cos\theta$ increases as θ increases. (iv) $\sin\theta = \cos\theta$ for all v

Watch Video Solution

Ncert Corner Textbook Questions Exercise 8 3

1. Evaluate :

$$\frac{\sin 18^\circ}{\cos 72^\circ}$$

Watch Video Solution

2. Evaluate :

$$\frac{\tan 26^\circ}{\cot 64^\circ}$$

Watch Video Solution

3. Evaluate :

$$\cos 48^\circ - \sin 42^\circ$$

Watch Video Solution

4. Evaluate :

$\text{cosec} 31^\circ - \sec 59^\circ$

Watch Video Solution

5. Show that $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$.

Watch Video Solution

6. Evaluate : $\cos 38^\circ \cos 52^\circ - \sin 38^\circ \sin 52^\circ$.

Watch Video Solution

7. If tan A $= \cot(A - 18^\circ)$ where 2A is an acute angle , find the value of A.

Watch Video Solution

8. If tan A = cot B , prove that A + B = 90° .

Watch Video Solution

9. If sec 4A = cosec $(A - 20^\circ)$, where 4A is an acute angle, find the value of A.

Watch Video Solution

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

Watch Video Solution

11. Express $s \in 67 \oplus \cos 75o$ in terms of trigonometric ratios of angles between $0o\ and\ 45o$.

Watch Video Solution

Ncert Corner Textbook Questions Exercise 8 4

1. Express the trigonometric ratios sin A, sec A and tan A in terms of cot A.

Watch Video Solution

2. Write all the other trigonometric ratios of $\angle A$in terms of sec A.

Watch Video Solution

3. Evaluate: (i) $\frac{\sin^2 63 \oplus \sin^2 27o}{\cos^2 17 \oplus \cos^2 73o}$ (ii)

$s \in 25o \backslash \quad \cos 65 \oplus \cos \backslash \quad 25os \in \backslash \quad 65o$

Watch Video Solution

4. Evaluate: $\sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ$.

Watch Video Solution

5. Choose the correct option.

$9\sec^2 A - 9\tan^2 A =$

A. 1

B. 8

C. 9

D. 0

Answer: B

Watch Video Solution

6. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \text{cosec}\ \theta)$ is equal to :

A. 0

B. 1

C. 2

D. -1

Answer: C

Watch Video Solution

7. Choose the correct optioin . Justify your choice.

$(\sec A + \tan A)(1 - \sin A)$ =

A. sec A

B. sin A

C. cosec C

D. cos A

Answer: D

Watch Video Solution

8. Choose the correct optioin . Justify your choice.

$$\frac{1+\tan^2 A}{1+\cot^2 A}=$$

A. $\sec^2 A$

B. -1

C. $\cot^2 A$

D. $\tan^2 A$

Answer: D

Watch Video Solution

9. Prove the following identity, where the angles involved are acute angles for which the expressions are defined. (i) $(\mathrm{cosec}\ \theta \cot\theta)^2 = \frac{1-\cos\theta}{1+\cos\theta}$

Watch Video Solution

10. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(ii)

$$\frac{\cos A}{1+\sin A}+\frac{1+\sin A}{\cos A}=2\sec A$$

Watch Video Solution

11. Prove the following identity, where the angles involved are acute angles for which the expressions are defined. (iii)

$$\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\backslash\,\mathrm{cosec}\backslash\ \theta$$

Watch Video Solution

12. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(iv)

$$\frac{1+\sec A}{\sec A}=\frac{\sin^2 A}{1-\cos A}$$

Watch Video Solution

13. Prove that

$$\frac{\cot\theta + \operatorname{cosec}\theta - 1}{\cot\theta - \operatorname{cosec}\theta + 1} = \frac{1+\cos\theta}{\sin\theta}.$$

Watch Video Solution

14. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(vi)

$$\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$$

Watch Video Solution

15. Prove the following identities, where the angles involved are acute angles for which the expressions are defined.

$$\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$$

Watch Video Solution

16. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(viii) $(\sin A + \cos ecA)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

Watch Video Solution

17. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(ix) $(cosec\ A\ \sin A)(\sec A - \cos A) = \dfrac{1}{\tan A + \cot A}$[Hint : Simplify LHS and RHS separately]

Watch Video Solution

18. Prove the following identity, where the angles involved are acute angles for which the expressions are defined.(x) $\left(\dfrac{1 + \tan^2 A}{1 + \cot^2 A}\right) = \left(\dfrac{1 - \tan A}{1 - \cot A}\right)^2 = \tan^2 A$

Watch Video Solution

Ncert Exemplar Exercise 8 1 Choose The Correct Answer From The Given Four Options

1. If cos A=$\frac{4}{5}$, then the value of tanA is

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

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

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

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

Answer: B

Watch Video Solution

2. if $\sin A = \frac{1}{2}$, then the value of $\cot A$

A. $\sqrt{3}$

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

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

D. 1

Answer: A

Watch Video Solution

3. The value of the expression cosec $(75^\circ + \theta) - \sec(15^\circ) - \theta) - \tan(55^\circ + \theta) + \cot(35^\circ - \theta)$ is

A. -1

B. 0

C. 1

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

Answer: B

Watch Video Solution

4. If $\sin\theta = \frac{a}{b}$, then $\cos\theta$ is equal to

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

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

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

D. $\frac{a}{\sqrt{b^2 - a}}$

Answer: C

Watch Video Solution

5. If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to

A. $\cos\beta$

B. $\cos 2\beta$

C. $\sin\alpha$

D. $\sin 2\alpha$

Answer: B

Watch Video Solution

6. Value of $(\tan 1^\circ \tan 2^\circ \tan 3^\circ \ldots \tan 89^\circ)$ is :

A. 0

B. 1

C. 2

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

Answer: B

Watch Video Solution

7. If $\cos 9\alpha = \sin \alpha$ and $9\alpha < 90^\circ$, then the value of $\tan 5\alpha$ is

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

B. $\sqrt{3}$

C. 1

D. 0

Answer: C

Watch Video Solution

8. If ΔABC is right angled at C, then the value of cos(A+B) is

A. 0

B. 1

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

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

Answer: A

Watch Video Solution

9. If $\sin A + \sin^2 A = 1$, then the value of the expression $\left(\cos^2 A + \cos^4 A\right)$ is

A. 1

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

C. 2

D. 3

Answer: A

Watch Video Solution

10. If $\sin\alpha = \frac{1}{2}$ and $\cos\beta = \frac{1}{2}$, then the value of $(\alpha + \beta)$ is

A. 0°

B. 30°

C. 60°

D. 90°

Answer: D

Watch Video Solution

11. Find the value of $\left[\frac{\sin^2 22^\circ + \sin^2 68^\circ}{\cos^2 22^\circ + \cos^2 68^\circ} + \sin^2 63^\circ + \cos 63^\circ \sin 27^\circ\right]$

A. 3

B. 2

C. 1

D. 0

Answer: B

Watch Video Solution

12. If 4 $\tan\theta$=3, then $\left(\frac{4\sin\theta - \cos\theta}{4\sin\theta - \cos\theta}\right)$ is equal to

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

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

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

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

Answer: C

Watch Video Solution

13. if $\sin\theta - \cos\theta = 0$, then the value of $\left(\sin^4\theta + \cos^4\theta\right)$ is

A. 1

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

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

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

Answer: C

Watch Video Solution

14. The value of $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is

A. $2\cos\theta$

B. 0

C. $2\sin\theta$

D. 1

Answer: B

Watch Video Solution

Ncert Exemplar Exercise 8 2 True Or False

1. value of $\frac{\tan 47^\circ}{\cot 43^\circ} =$

Watch Video Solution

2. The value of the expression $\left(\cos^2 23^\circ - \sin^2 67^\circ\right)$ is

Watch Video Solution

3. The value of the expression $(\sin 80^\circ - \cos 80^\circ)$ is negative.

Watch Video Solution

4. $\sqrt{(1-\cos^2\theta)\sec^2\theta}\ [\because \sin^2\theta + \cos^2\theta = 1]$

$= \sqrt{\sin^2\theta \frac{.1}{\cos^2\theta}} = \sqrt{\tan^2\theta} = \tan\theta$

$\left[\because \sec\theta = \frac{1}{\cos\theta}, \tan\theta = \frac{\sin\theta}{\cos\theta}\right]$

Watch Video Solution

5. If $\cos A + \cos^2 A = 1$, then $\sin^2 A + \sin^4 A$ is equal to

Watch Video Solution

6. $(\tan\theta + 2)(2\tan\theta + 1) = 5\tan\theta + \sec^2\theta$. Write 'True' or 'False' and justify your Solution.

Watch Video Solution

7. The value of $2\sin\theta$ can be a$+\frac{1}{a}$, where a is a positive number and $a \neq 1$.

Watch Video Solution

8. $\cos\theta = \frac{a^2 + b^2}{2ab}$, where a and b are two distinct numbers such that $ab > 0$.

Watch Video Solution

Ncert Exemplar Exercise 8 3

1. Prove that : $\frac{\sin\theta}{1+\cos\theta}+\frac{1+\cos\theta}{\sin\theta}=2\text{cosec}\theta$

Watch Video Solution

2. Prove the following

$$\frac{\tan A}{1+\sec A}-\frac{\tan A}{1-\sec A}=2\text{cosec}A$$

Watch Video Solution

3. If $\tan A=\frac{3}{4}$, then $\sin A\cos A=$.

Watch Video Solution

4. Prove that $(\sin\alpha+\cos\alpha)(\tan\alpha+\cot\alpha)=\sec\alpha+\text{cosec}\alpha$

Watch Video Solution

5. Prove that $\left(\sqrt{3}+1\right)\left(3-\cot 30^{\circ}\right)=\tan^{3}(60)^{\circ}-2\sin 60^{\circ}$

Watch Video Solution

6. Prove that : $1+\dfrac{\cot^{2}\alpha}{1+\operatorname{cosec}\alpha}=\operatorname{cosec}\alpha$

Watch Video Solution

7. $\tan\theta+\tan(90^{\circ}-\theta)=\sec\theta\times\sec(90^{\circ}-\theta)$

Watch Video Solution

8. If $\sqrt{3}\tan\theta=1$ then find value of $\sin^{2}\theta-\cos^{2}\theta$

Watch Video Solution

9. Simplify $\left(1+\tan^{2}\theta\right)(1-\sin\theta)(1+\sin\theta)$

Watch Video Solution

10. If $2\sin^2\theta - \cos^2\theta, = 2$ then find the vlaue of θ

Watch Video Solution

11. What is $\frac{\cos^2(45^\circ + \theta) + \cos^2(45^\circ - \theta)}{\tan(60^\circ + \theta)\tan(30^\circ - \theta)}$ equal to ?

Watch Video Solution

12. Prove that :

$\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$

Watch Video Solution

Ncert Exemplar Exercise 8 4

1. If $\cos ec\theta + \cot\theta = p$, then $\cos\theta =$

Watch Video Solution

2. Prove that

$\sqrt{\sec^2\theta + \text{cosec}^2\theta} = \tan\theta + \cot\theta.$

Watch Video Solution

3. If $1 + \sin^2\theta = 3\sin\theta\cos\theta$, then prove that $\tan\theta = 1$ or $\frac{1}{2}$.

Watch Video Solution

4. If $\sin\theta + 2\cos\theta = 1$,then $2\sin\theta - \cos\theta =$

Watch Video Solution

5. if $\tan\theta + \sec\theta = l$ then prove that $\sec\theta = \frac{l^2+1}{2l}$

Watch Video Solution

6. If $\sin\theta + \cos\theta = p$ and $\sec\theta + \text{cosec}\theta = q$ then prove that $q(p^2-1) = 2p$.

Watch Video Solution

7. If $a\sin\theta + b\cos\theta = c$ then prove that $a\cos\theta - b\sin\theta = \sqrt{a^2+b^2-c^2}$

Watch Video Solution

8. prove that $\frac{\sec\theta - \tan\theta - 1}{\sec\theta + \tan\theta - 1} = \tan\theta - \sec\theta$

Watch Video Solution

Board Corner Very Short Answer Type Questions

1. Find A , if tan $2A = \cot(A - 24^\circ)$

Watch Video Solution

2. Find the value of $\left(\sin^2 33^\circ + \sin^2 57^\circ\right)$

Watch Video Solution

3. Evaluate : $\sin^2 60^\circ + 2\tan 45^\circ - \cos^2 30^\circ$

Watch Video Solution

4. If $\sin A = \frac{3}{4}$ calculate sec A.

Watch Video Solution

5. What is the value of $\left(\cos^2 67^\circ - \sin^2 23^\circ\right)$?

Watch Video Solution

Board Corner Short Answer Type Questions

1. Prove that

$$(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = \left(7 + \tan^2\theta + \cot^2\theta\right).$$

Watch Video Solution

2. Prove that

$$(1 + \cot\theta - \operatorname{cosec}\theta)(1 + \tan\theta + \sec\theta) = 2.$$

Watch Video Solution

3. Evaluate the

$$\left(\frac{3\cos 43^\circ}{\sin 47^\circ}\right)^2 - \frac{\cos 37^\circ \operatorname{cosec} 53^\circ}{\tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 65^\circ \tan 85^\circ}$$

Watch Video Solution

4. Find acute angles $A and B$, if $\sin(A+2B) = \frac{\sqrt{3}}{2} and \cos(A+4B) = 0, A > B.$

Watch Video Solution

5. If $4\tan\theta = 3$, evaluate $\left(\frac{4\sin\theta - 2\cos\theta + 3}{4\sin\theta + 2\cos\theta - 5}\right)$

Watch Video Solution

6. If tan A $= \cot(A - 18^\circ)$ where 2A is an acute angle , find the value of A.

Watch Video Solution

Board Corner Long Solution Type Questions

1. Prove that $\frac{\sin A - \cos A + 1}{\sin A + \cos A - 1} = \frac{1}{\sec A - \tan A}$

Watch Video Solution

2. Prove that :

$$\frac{\tan^2\theta}{\tan^2\theta - 1} + \frac{\operatorname{cosec}^2\theta}{\sec^2\theta - \operatorname{cosec}^2\theta} = \frac{1}{\sin^2\theta - \cos^2\theta}.$$

Watch Video Solution

3. If $\sec\theta = x + \frac{1}{4x}$, the value of $\sec\theta + \tan\theta$ is equal to

Watch Video Solution

4. Prove that: $\left(\sin\theta - 2\sin^3\theta\right) = \left(2\cos^3\theta - \cos\theta\right)\tan\theta.$

Watch Video Solution

5. Prove each of the following identities :

$$\frac{\tan\theta}{(1-\cot\theta)}+\frac{\cot\theta}{(1-\tan\theta)}=(1+\sec\theta\text{cosec}\theta)$$

Watch Video Solution

6. Prove each of the following identities :

$$\frac{\sin\theta}{(\cot\theta+\text{cosec}\theta)}-\frac{\sin\theta}{(\cot\theta-\text{cosec}\theta)}=2$$

Watch Video Solution