: 99672 40893

Jars Education

Shop no. 2,3,4 hendre pada Badlapur west thane

Time : 1 Hour 30 Minute

STD 10 Maths
Chapter Based Test

Total Marks : 50

Section A

* **Choose the right answer from the given options. [1 Marks Each]** [7]

1. The value of $\tan\theta . \tan(90-\theta)$ is equal to:

   (A) $\sin^2\theta$ (B) 1 (C) $\cos^2\theta$ (D) 0

2. Choose the correct answer from the given four options.

   If $\cos A = \frac{4}{5}$, then the value of $\tan A$ is:

   (A) $\frac{3}{5}$ (B) $\frac{3}{4}$ (C) $\frac{4}{3}$ (D) $\frac{5}{3}$

3. $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}$ is equal to:

   (A) $\sec\theta+\tan\theta$ (B) $\sec\theta-\tan\theta$ (C) $\sec^2\theta+\tan^2\theta$ (D) $\sec^2\theta-\tan^2\theta$

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

   a. $\frac{a^2+b^2}{a^2-b^2}$
   b. $\frac{a^2-b^2}{a^2+b^2}$
   c. $\frac{a+b}{a-b}$
   d. $\frac{a-b}{a+b}$

5. $2(\sin^6\theta+\cos^6\theta)-3(\sin^4\theta+\cos^4\theta)$ is equal to:

   a. 0
   b. 1
   c. -1
   d. None of these.

6. $\frac{\sin\theta}{1+\cos\theta}$ is equal to:

   a. $\frac{1+\cos\theta}{\sin\theta}$
   b. $\frac{1-\cos\theta}{\cos\theta}$
   c. $\frac{1-\cos\theta}{\sin\theta}$
   d. $\frac{1-\sin\theta}{\cos\theta}$

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

   a. $\sin A$
   b. $\cos A$
   c. $\sec A$

d. $\text{cosec}A$

* **A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** **[3]**

8. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

   Assertion: $(\cot\theta + 3)(3\cot\theta + 1) = 3\text{cosec}^2\theta + 10\cot\theta$.

   Reason: $1 + \cot^2\theta = \text{cosec}^2\theta$.

   a. A is true, R is true; R is a correct explanation for A.
   b. A is true, R is true; R is not a correct explanation for A.
   c. A is true; R is false.
   d. A is false; R is true.

9. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

   Assertion: $\sin 60^\circ = \cos 30^\circ$.

   Reason: $\sin 2\theta = \sin\theta + \sin\theta$, where θ is an acute angle.

   a. A is true, R is true; R is a correct explanation for A.
   b. A is true, R is true; R is not a correct explanation for A.
   c. A is true; R is false.
   d. A is false; R is true.

10. **Directions:** In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

    Assertion: The equation $\sec^2\theta = \frac{4xy}{(x+y)^2}$ is only possible when x = y.

    Reason: $\sec^2\theta > 1$ and therefore $(x - y)^2 < 0$.

    a. A is true, R is true; R is a correct explanation for A.
    b. A is true, R is true; R is not a correct explanation for A.
    c. A is true; R is false.
    d. A is false; R is true.

* **State whether the following sentences are True or False. [1 Marks Each]** **[2]**

11. State whether the following are true or false. Justify your answer.
    $\cot A$ is the product of $\cot$ and A.

12. State whether the following are true or false. Justify your answer.
    $\sin\theta = \cos\theta$ for all values of θ.

* **Answer the following questions in one sentence. [1 Marks Each]** **[2]**

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

14. If sin (A - B) = $\frac{1}{2}$, cos (A + B) = $\frac{1}{2}$, 0° < A + B $\leq$ 90°, A > B find A and B.

Section B

* **Given section consists of questions of 2 marks each.** **[10]**

1. State whether the following are true or false. Justify your answer.
   cos A is the abbreviation used for the cosecant of angle A.

2. In a $\triangle ABC$, right angled at B, AB = 24cm, BC = 7cm. Determine:
$\sin C, \cos C$

3. Prove the following trigonometric identities.
$\frac{1+\cos\theta-\sin^2\theta}{\sin\theta(1+\cos\theta)} = \cot\theta$

4. Prove that:
$\frac{\cos 80^\circ}{\sin 10^\circ} + \cos 59^\circ \operatorname{cosec} 31^\circ = 2$

5. Prove that:
$\tan(55^\circ - \theta) - \cot(35^\circ + \theta) = 0$

Section C

*** Given section consists of questions of 3 marks each.** **[12]**

1. In the following, one of the six trigonometric ratios is given. Find the values of the other trigonometric ratios.
$\sin\theta = \frac{\sqrt{3}}{2}$

2. Prove the following:
$\sin(50^\circ + \theta) - \cos(40^\circ - \theta) + \tan 1^\circ \tan 10^\circ \tan 70^\circ \tan 80^\circ \tan 89^\circ = 1$

3. If $\sin\theta = \frac{3}{4}$, prove that $\sqrt{\frac{\operatorname{cosec}^2\theta-\cot^2\theta}{\sec^2\theta-1}} = \frac{\sqrt{7}}{3}$.

4. Prove the following trigonometric identities.
$\frac{\cos A \operatorname{cosec} A-\sin A \sec A}{\cos A+\sin A} = \operatorname{cosec} A - \sec A$

Section D

*** Given section consists of questions of 5 marks each.** **[10]**

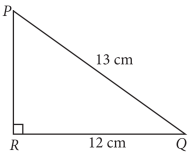
1. Find the lengths of the medians of a ΔABC having vertices at A(5, 1), B(1, 5), and C(-3, -1).

2. Prove the following identities:
$\sin^2\theta + \cos^4\theta = \cos^2\theta + \sin^4\theta$

Section E

*** Case study based questions** **[4]**

1. Anita, a student of class 10th, has to made a project on 'Introduction to Trigonometry'. She decides to make a bird house which is triangular in shape. She uses cardboard to make the bird house as shown in the figure. Considering the front side of bird house as right angled triangle PQR, right angled at R, answer the following questions.



i. If $\angle PQR = \theta$, then $\cos\theta =$

ii. The value of $\sec\theta =$

iii. The value of $\frac{\tan\theta}{1+\tan^2\theta} =$

Or

The value of $\cot^2\theta - \operatorname{cosec}^2\theta =$

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