Important Assertion And Reason Questions On Introduction To Trigonometry

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

Choose the correct option for the following questions:

- (A). Both Assertion (A) and Reason (R) are true, and Reason is the correct explanation of Assertion.
- (B). Both Assertion (A) and Reason (R) are true, but Reason is not the correct explanation of Assertion.
- (C). Assertion (A) is true, but Reason (R) is false.
- (D). Assertion (A) is false, but Reason (R) is true.

Question 1:

Assertion (A): Trigonometric ratios are defined with respect to the angles of a right triangle.

Reason (R): A right triangle contains one angle equal to (90^\circ).

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 2:

Assertion (A): The value of $\sin 30^\circ$ is $\frac{1}{2}$.

Reason (R): In a $30^\circ - 60^\circ - 90^\circ$ triangle, the side opposite to 30° is half the hypotenuse.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 3:

Assertion (A): The value of $\cos 0^\circ$ is 1.

Reason (R): The side adjacent to angle 0° is equal to the hypotenuse.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 4:

Assertion (A): The value of $\tan 45^\circ$ is 1.

Reason (R): In a $45^\circ - 45^\circ - 90^\circ$ triangle, the opposite side and adjacent side are equal.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 5:

Assertion (A):

The trigonometric ratio $\sin\theta$ is given by:

$\sin\theta = \text{PerpendicularHypotenuse}$

Reason (R): The hypotenuse is the longest side of a right triangle.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 6:

Assertion (A): The value of sec0◦ is 1.

Reason (R): secθ is the reciprocal of cosθ .

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

sec0◦=1cos0◦=11=1

Question 7:

Assertion (A): The value of \cosec90◦ is 1.

Reason (R): \cosecθ is the reciprocal of sinθ .

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 8:

Assertion (A): tan0◦=0

Reason (R): tanθ=sinθcosθ

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 9:

Assertion (A): The value of $\sin 2\theta + \cos 2\theta$ is always 1.

Reason (R): This is a fundamental trigonometric identity.

$\sin 2\theta + \cos 2\theta = 1$

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 10:

Assertion (A): $\tan\theta$ is undefined for $\theta = 90^\circ$.

Reason (R): $\cos 90^\circ = 0$.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 11:

Assertion (A): The value of $\cot 45^\circ$ is 1.

Reason (R): $\cot\theta$ is the reciprocal of $\tan\theta$.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 12:

Assertion (A): $\sin 90^\circ = 1$

Reason (R): The perpendicular side becomes equal to the hypotenuse at 90°.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 13:

Assertion (A): $\sec\theta = 1\cos\theta$

Reason (R): Secant is the reciprocal ratio of cosine.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 14:

Assertion (A): The value of $\cos 60^\circ$ is 12.

Reason (R): In a $30^\circ - 60^\circ - 90^\circ$ triangle, the adjacent side to 60° is half the hypotenuse.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

Question 15:

Assertion (A): $\tan\theta = \sin\theta\cos\theta$

Reason (R): Division of the sine ratio by the cosine ratio gives the tangent ratio.

Options:

(A). Both A and R are true, and R is the correct explanation of A.
(B). Both A and R are true, but R is not the correct explanation of A.
(C). A is true, but R is false.
(D). A is false, but R is true.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A.

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