

Application of Derivatives

Part - 3

ASSERTION-REASON QUESTIONS

In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (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 and R is also false.

1. **Assertion (A):** The rate of change of area of a circle with respect to its radius r when $r = 6$ cm is 12π cm²/cm.

Reason (R): Rate of change of area of a circle with respect to its radius r is $\frac{dA}{dr}$, where A is the area of the circle.

2. **Assertion (A):** $f(x) = \tan x - x$ always increases.

Reason (R): Any function $y = f(x)$ is increasing if $\frac{dy}{dx} > 0$.

3. **Assertion (A):** $f(x) = x^4$ is decreasing in the interval $(0, \infty)$.

Reason (R): Any function $y = f(x)$ is decreasing if $\frac{dy}{dx} < 0$.

4. **Assertion (A):** The slope of the tangent to the curve $y = x^3$ where it cuts x -axis, is 0.

Reason (R): Slope of tangent to the curve $y = f(x)$ at point (x_0, y_0) is $\frac{dy}{dx}$ at (x_0, y_0) .

Answers

1. (a) 2. (a) 3. (d) 4. (a)