VSA
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Little Steps
Pre Primary wing of VSA
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Class – 12th **Chapter-8** **Subject Maths**

Worksheet-34 Application of Derivatives

1. Find the rate of change of the area of a circle with respect to radius r, when $r = 3$ cm and $r = 4$ cm.
2. A particle is moving along the curve $y = \frac{2}{3}x^3 + 1$. Find the points on the curve at which the y-coordinate is changing twice as fast as the x coordinate.
3. A ladder 13 m long is leaning against a wall. The bottom of the ladder is pulled along the ground, from the wall, at the rate of 1.5 m / s. How fast is its height on the wall decreasing when the foot of the ladder is 12 m away from the wall?
4. An edge of a variable cube is increasing at the rate of 3 cm / s. Fnd the rate at which the volume of the cube increasing when the edge is 10 cm long?
5. A ballon which always remains spherical on inflation, is being inflated by pumping at the rate of 900 cm^3 /s. of gas. Find the rate at whcih the radius of ballon increases when the radius is 15 cm.
6. A ballon, which always remains spherical has a variable diameter $\frac{3}{2}(2x+1)$. Find the rate at which its volume is increasing with respect to x.
7. The total cost $C(x)$ rupees, associated with the production of x units of an item is given by
$$C(x) = 0.005\ x^3 - 0.02\ x^2 + 30\ x + 5000$$
Find the marginal cost when 3 units are produced, here by marginal cost we mean the instantaneous rate of change of total cost at any level of output.
8. The radius of a soap bubble is increasing at the rate of 0.2 cm / s. Find the rate of increase in surface area when the radius is 7 cm. Also find the rate of change in volume when the radius is 5 cm.