

Comprehensive Test Series-01
(Application of Derivatives)

XII

TIME: 30 min

MM: 25

General Instructions:

- All Questions are compulsory.
 - Use of calculator is not permitted.
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Q.1 Find the equation of all lines having slope 2 and being tangent to the curve

$$y + \frac{2}{x-3} = 0.$$

Q.2 Find point on the curve $\frac{x^2}{4} + \frac{y^2}{25} = 1$ at which the tangents are (i) parallel to x-axis (ii) parallel to y-axis.

Q.3 Find the point on the curve $y = (x - 2)^2$ at which the tangent is parallel to the chord joining the points (2, 0) and (4, 4).

Q.4 For the curve $y = 4x^3 - 2x^5$, Find all the points at which the tangent passes through the origin.

Q.5 Find the point on the curve $x^2 + y^2 - 2x - 3 = 0$ at which the tangents are parallel to the x-axis.

Q.6 Find the equation of the normal at the point (am^2, am^3) for the curve $ay^2 = x^3$.

Q.7 Prove that the curves $x = y^2$ and $xy = k$ cut at right angles if $8k^2 = 1$.

Q.8 Find the equations of the tangent and normal to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ at the point (x_0, y_0) .