

## Worksheet: Application of Derivatives (Rate of Change, Tangents, Maxima/Minima)

Bihar State Board · Class 12 · Mathematics · 3 questions · 14 marks

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 14

**Q1.** Find the equations of the tangent and normal to the curve  $y = x^2 - 3x + 2$  at the point  $(2, 4)$ . [3 marks]

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**Q2.** A window is in the form of a rectangle surmounted by a semicircular opening. The total perimeter of the window is 10 m. Find the dimensions of the window that will admit maximum light through the whole opening. [5 marks]

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**Q3.** Prove that the volume of the largest cone that can be inscribed in a sphere of radius  $R$  is  $\frac{8}{27}$  of the volume of the sphere. [6 marks]

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