

Chapter 6 Class 12 - Application of Derivatives - Mix Questions Worksheet 2 by *teachoo*

Chapter: [Chapter 6 Class 12 - Application of Derivatives](#)

Name: _____

School: _____

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3-Mark Questions

1. Show that the function $f(x) = x^3 - 3x^2 + 6x + 7$ is strictly increasing on the set of all real numbers.
2. A 13 -foot ladder is leaning against a wall. If the bottom of the ladder is pulled away from the wall at a rate of 2ft/s, how fast is the top of the ladder sliding down the wall when the bottom of the ladder is 5 feet from the wall?
3. Find the absolute maximum and minimum values of the function $f(x) = x^3 - 6x^2 + 5$ on the interval $[-1, 5]$.

4. The total revenue from selling x units of a product is given by $R(x) = 13x^2 + 26x + 15$. The total cost is $C(x) = 5x^2 + 10x + 100$. At what level of output x will the profit be maximized?
5. Prove that of all rectangles with a given perimeter, the square has the maximum area.

5-Mark Questions

6. A window is being built in the shape of a rectangle surmounted by a semicircle. The perimeter of the window is fixed at 10 meters. Find the dimensions (width and height of the rectangle) that will allow the maximum possible amount of light to enter.
7. Find the point on the parabola $y^2 = 2x$ that is closest to the point (1,4).
8. Sand is being poured from a pipe at a rate of $12 \text{ cm}^3/\text{s}$. The falling sand forms a cone on the ground in such a way that the height of the cone is always one-sixth of the radius of the base. How fast is the height of the sand cone increasing when the height is 4 cm ?
9. Find all points of local maxima and local minima for the function $f(x) = 2x^3 - 21x^2 + 36x - 20$. Use the second derivative test to justify your answers.

Important links

- Answer of this worksheet - <https://www.teachoo.com/25583/5357/Mix-Questions---Worksheet-2/category/Teachoo-Questions---Mix/>
- Full Chapter with Explanation, Activity, Worksheets and more – <https://www.teachoo.com/subjects/cbse-maths/class-12th/ch6-12th-application-of-derivatives/>
- Maths Class 12 - <https://www.teachoo.com/subjects/cbse-maths/class-12th/>

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