1. Find $\lim_{x \to 100} (1600x - x^2)$ if it exists.

2. Sales $y$ (in thousands of dollars) are related to advertising expenses $x$ (in thousands of dollars) according to

$$y = y(x) = \frac{200x}{x + 10}, \quad x \geq 0.$$ 

Find $\lim_{x \to 10} y(x)$.

3. For what values of $x$ is the function

$$y = \frac{x^2 - 9}{x + 3}$$

discontinuous.

4. Suppose the total revenue function for a blender is $R(x) = 36x - x$, where $x$ is the number of units sold. Find the marginal revenue.

5. Find the derivative of $f(x) = x^3 + 6x^2 - 5x + 4$.

6. Find the derivative of $f(x) = \sqrt{x^3 + 5}$.

7. If the cost $C$ of removing $p$ percent of the particulate pollution from the exhaust gases at an industrial site is given by

$$C(P) = \frac{8100p}{100 - p}.$$ 

Find the rate of change of $C$ with respect to $p$.

8. Find the derivative of $f(x) = (x^3 + 1)^4$.

9. The revenue from sales of a certain product can be described by

$$R(x) = 100x - 0.01x^2.$$ 

Find the instantaneous rate of change of the marginal revenue.