

Introduction to derivatives (§§2.1–2.2)

1. 2.2 #23, #25, #45
2. Let $f(x) = 2x^2$. Use the limit definition of derivative to find $f'(3)$.
3. Let $f(x) = 2x^2$. Use the limit definition of derivative to find $f'(x)$.

4. Let

$$f(x) = \begin{cases} x^2 \sin(1/x^2) & \text{if } x \neq 0 \\ 0 & \text{if } x = 0. \end{cases}$$

Show that $f'(0)$ exists and find its value.