Answer on Question #49865 – Math – Calculus

Given: x^2[f(x)]^2=9; and f9-10=3 Find f''(-1) by implicit differentiation.

Solution

$$\boldsymbol{x^2 f(x)^2 = 9 \rightarrow \ \frac{d}{dx}[x^2 f(x)^2] = \frac{d}{dx}(9) \ \rightarrow \ 2xf^2 + 2x^2 ff' = 0 \rightarrow}$$

$$\boldsymbol{\rightarrow \ f'(x) = -\frac{f(x)}{x}}$$

$$\boldsymbol{f''(x) = -\frac{f'(x)}{x} + \frac{f(x)}{x^2} = 2\frac{f(x)}{x^2}}$$

$$\boldsymbol{f''(-1) = 2\frac{3}{(-1)^2} = 6}$$