

MATH 1101Y 2009 Quiz 4 (b)

Differentiate the function.

1. (1 pt)

$$f(x) = \frac{x^2 + 2x^2 - \sqrt[3]{x}}{x}$$

Solution: Since

$$\begin{aligned} f(x) &= 3x - x^{-\frac{2}{3}}, \\ f'(x) &= 3 - \left(-\frac{2}{3}\right)x^{-\frac{5}{3}} \\ &= 3 + \frac{2}{3}x^{-\frac{5}{3}}. \end{aligned}$$

□

2. (2 pts)

$$\frac{e^x \sin x}{1 + \cos x}$$

Solution:

$$\left(\frac{e^x \sin x}{1 + \cos x}\right)' = \frac{(e^x \sin x + e^x \cos x)(1 + \cos x) - e^x \sin x(-\sin x)}{(1 + \cos x)^2}.$$

□

3. (2 pts)

$$\tan(\sin \sqrt{x})$$

Solution:

$$(\tan(\sin \sqrt{x}))' = \sec^2(\sin \sqrt{x}) \cdot \cos(\sqrt{x}) \cdot \frac{1}{2\sqrt{x}}.$$

□