Directions: Differentiate the following functions.

$$1. \quad y = \left(x^3 + \cos(x)\right)^8$$

$$2. \quad y = \sqrt{x^2 + 9}$$

3.
$$y = (\tan(x) + x)(1 + e^x)^{100}$$

$$4. y = \sin\left(e^{5x^2}\right)$$

Directions: Differentiate the following functions.

$$1. \quad y = \sqrt[3]{\cos(x) + \sin(x)}$$

2.
$$y = (x^3 + 2e^x)^7$$

3.
$$y = (x + e^x) (1 + \tan(x))^{100}$$

$$4. \qquad y = e^{\sin(5x^2)}$$