Directions: Differentiate the following functions.

1. $y = 1 + x^5 + e^{x^2 + \sin(x)}$

2. $y = \left(\dfrac{x + x^2}{1 + x^3} \right)^{10}$

3. $y = \sin^3(4x)$

4. $y = \sqrt{x^2 + e^{5x}}$

5. $y = xe^{-x}$

Directions: Differentiate the following functions.

1. $y = \dfrac{1}{3}e^{x^3+3x}$

2. $y = (2 + 3e^x)^5$

3. $y = \sqrt{x + \sin(x)}$

4. $y = \dfrac{1}{\tan(3x + 1)}$

5. $y = \sec(e^x) + e^{\sec(x)}$