

Name: _____

Score: _____

1. Find the derivative of the following functions (1 point each)

(a) $f(x) = (x^2 + 2)^3$

(b) $f(x) = \sin\left(\frac{1}{x}\right)$

(c) $f(x) = 3^{x^2}$

(d) $f(x) = (1 - \sin x)^2$

(e) $f(x) = \cos(e^{3x})$

(f) $f(x) = \sqrt{\frac{1-x^2}{1+x^2}}$

2. Find the equation of the tangent line to $x^2y + xy^2 = 6$ at $(2, 1)$. (3 points)

3. Let $h(x) = f(x)g(x)$

(a) Show that $h''(x) = f''(x) + 2f'(x)g'(x) + g''(x)$. (1 point)

(b) Find a formula for the n^{th} derivative of $h(x)$. (Bonus 1 point)