

CALCULUS SAMPLE HW DERIVATIVES

Name: _____

Score: _____

(1) Find the derivative of each of the following functions. You do not need to simplify your answers.

(a) $f(x) = \frac{\cos^8(x)}{(e^x)^{-2}}$

(b) $f(x) = \tan(\sin(x^2 + 1))$

(c) $f(x) = \sqrt{\sin^2(x) + \cos^2(x)}$

(e) $f(x) = 2^{\sin(x)}$

(2) Find the equation of the tangent line to the graph of $f(x) = \tan(e^{x^2})$ at the point where $x = 0$. You may leave your answer in point-slope form.

(3) Find y' (equivalently, $\frac{dy}{dx}$) using implicit differentiation:

(a) $\sin(x - y) = xy$

(b) $e^{x+y} = y$

(4) Find the slope of the tangent line to the graph of $x^2 + y^2 = 5$ at the point $(1, 2)$.

(5) If $f(x) = x^5$ and g is its inverse function. Find $g'(y_0)$ if $y_0 = 32$.

(6) Find the derivative of $f(x) = \sin^{-1}(4x)$.