

Calculus 1510 Tutorial #5

1. Find  $\frac{dy}{dx}$  if: DO NOT SIMPLIFY YOUR ANSWERS.

(a)  $y = \sin(\pi x^2) + \cos(\sqrt{x})$

(b)  $y = \sin(2 \cos x) + \tan(x \sin x)$

(c)  $y = \frac{\sin \sqrt{x}}{1 + \tan \sqrt{x}}$

(d)  $y = [x^3 + \sec x][\csc(\cot x)]$

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

(f)  $y \sin x = x^3 + \cos y$

2. Find  $\frac{d^2 y}{dx^2}$  if  $xy + y^2 = 2x$ .

3. Find an equation of the tangent line to the curve  $x^2 + xy + 2y^3 = 4$  at the point with coordinates  $(-2, 1)$ .

4. Find an equation of the normal line to the curve  $y = \cos^2 x$  at the point where  $x = \frac{2\pi}{3}$ .

5. Find  $f^{[50]}(x)$  if  $f(x) = \sin(2x)$ .