MATH 150 Review Key Exam 3

1. Find the derivative of the following:

(a) $y = tan(cos\ x)$

$$sec^2(cos\ x)(-sin\ x)$$

(b) $y = 2^{sin\ \pi x}$

$$2^{sin\ \pi x}(ln\ 2)(cos\ \pi x)(\pi)$$

(c) $y = xsin\frac{1}{x}$

$$(-\frac{1}{x})(cos\ \frac{1}{x}) + sin\ \frac{1}{x}$$

(d) $y = sin(sin(sin\ x))$

$$cos(sin(sin\ x))(cos(sin\ x)(cos\ x)$$

(e) $xy + 2x + 3x^2 = 4$

$$\frac{-6x - 2 - y}{x}$$

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

$$\frac{cos\ x - cos\ y\ cos\ x}{-sin\ x\ sin\ y + sin\ y}$$

(g) $y = \pi^{\pi}$

$$0$$

(h) $y = (x^3 - 2x^2 + 15)^4$

$$4(x^3 - 2x^2 + 15)^3(3x^2 - 4x)$$

(i) $y = x^2e^{cos\ x}$

$$x^2e^{cos\ x}(-sin\ x) + e^{cos\ x}(2x)$$

(j) $y = 6^{sec\pi\theta}$

$$6^{sec\ \pi\theta}(ln\ 6)(sec\ \pi\theta\ tan\ \pi\theta)(\pi)$$

(k) $y = arcsin(x^2)$

$$\frac{2x}{\sqrt{1-x^4}}$$

2. Find an equation of the tangent line to $x^2 + 4xy + y^2 = 13$ at the point $(2, 1)$.

$$\frac{-2x-4y}{4x+2y}$$

The equation is $y - 1 = -\frac{4}{5}(x-2)$