MATH 215 WORKSHEET #7

(1) Compute the derivative of the following functions.

(a) $n(x) = (3x^4 + 5x^3 + 6x)^{45}$

(b) $k(x) = (1 - 2^x)^{-1}$

(c) $m(x) = \sqrt[5]{4x^3 + \pi x^2 + 4}$

(d) $j(x) = \left(e^x + \dfrac{1}{x^2}\right)^{\sqrt{7}}$

(e) $q(x) = \tan\sqrt{1 - x}$

(2) Differentiate.

(a) $f(x) = \ln(x^3 - x + 9)$

(b) $f(x) = \ln(e^x + 1)$

(c) $f(x) = \ln(\sqrt{2x + 1})$

(d) $f(x) = \ln(\cos x)$

(3) Find the tangent line at the indicated point.
   (a) $x^2 + 3xy + y^2 = 11$ at $(1, 2)$

   (b) $x^3 + y^3 - 2xy = 0$ at $(1, 1)$

   (c) $\sqrt{x} + \sqrt{y} = 1$ at $(\frac{1}{4}, \frac{1}{4})$

   (d) $xy - y^3 = 1$ at $(2, 1)$

(4) Compute the derivatives of the following functions.
   (a) $f(x) = \arctan x^2$

   (b) $g(x) = \arcsin x^\pi$

   (c) $k(x) = \ln(\ln x)$

   (d) $u(x) = x \arctan x$

   (e) $v(x) = \arctan(x + 1)$