MATH 113 – QUIZ 5 – 26 FEBRUARY 2007

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (2 pt. each) The height s, in feet, of an object dropped from a tall building t seconds after it has been dropped is given by $s(t) = 256 - 16t^2$.

(a) Find expressions for the ball's velocity and acceleration at any time t.

$v(t) = s'(t) = -32t$ //

$a(t) = s''(t) = -32$ //

(b) Find the *speed* of the ball 2 seconds after it has been released (be sure to give correct units for your answer).

$v(2) = -64$ ft/sec

speed $= |v(2)| = 64$ ft/sec

(c) Find the velocity of the ball at the moment it hits the ground (be sure to give correct units for your answer).

ball hits ground when $s(t) = 0$.

$256 - 16t^2 = 0$

$16t^2 = 256$

$t^2 = 16$

$t = \pm 4$ sec.

$v(4) = -32(4) = -128$ ft/sec

2. (2 pts. each) Find the derivative of the following functions

(a) $f(x) = \tan(x) + e^x$.

$f'(x) = \sec^2(x) + e^x$

(b) $f(x) = \dfrac{\cos(x)}{x+1}$.

$f'(x) = \dfrac{(x+1)(-\sin(x)) - \cos(x)(1)}{(x+1)^2} = \dfrac{-\cos(x) - (x+1)\sin(x)}{(x+1)^2}$