MA 125   Test 2a

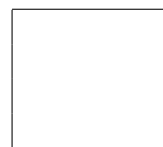NAME   : _____

STUDENT NO. _____

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1. Differentiate each function, provide a detailed calculation to get full credit. Write you final answer in the box.

(1). $y = \dfrac{2x^2 + 4x + 3}{\sqrt{x}}$

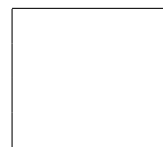(2). $y = \dfrac{1 + x}{e^x}$

(3). $f(x) = xe^x \sec x$

(4). $y = \csc(\tan x) + \tan^2 x$

(5). $h(t) = t^4 - 4^t$

(6). $f(x) = \ln(2 - x - 7x^2)$

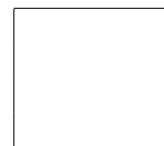2. Find dy/dx by implicit differentiation.

(1). $x^3 + 2x^2y + 4y^2 = 6$

(2). $4\cos y \sin x = xy$

3. Find y' and y'', if $y = 2e^{e^x}$.

4.Find an equation of the tangent line to the curve at the given point

(1) $y = (1 + 3x)^{10}$, $(0, 1)$

(2). $y = 4x^{\cot x}$, $(\pi/2, 0)$

5. (a) On what interval is $f(x) = x^3 + 3x^2 + 3x + 10$ decreasing?

(b) On what interval if f concave upward?

(c) Find the points on the curve at which the tangent is horizontal.