MAT 1339 C Fall 2010 November 3rd, 5:30 Instructor. S. Baek

TEST #2

Max = 20

Student Number: _____

• Time: 80 min.

• Only basic scientific calculators are permitted: non-programmable, non-graphing, no differentiation or integration capability. Notes or books are not permitted.

• Work all problems in the space provided. Use the backs of the pages for rough work if necessary. Do not use any other paper.

• Write *only* in non-erasable ink (ball-point or pen), not in pencil. Cross out, if necessary, but do not erase or overwrite. Graphs and sketches may be drawn in pencil.

• Problems require complete and clearly presented solutions and carry part marks if there is substantial correct work toward the solution.

1. [3 points] Find the derivative of the function $f(x) = \tan(3x) + \cos(2x) - \sin(x)$. Hint: recall that $\tan(x) = \frac{\sin(x)}{\cos(x)}$.

2. [3 points] Find the derivative of $h(x) = \frac{e^{7x}}{\cos(7x)}$.

3. [2 points] Find the equation of the tangent line to the graph of $f(x) = \sin(\sin(x)) + 1$ at $(0, 1) = (0, f(0))$.

4. [7 points] (i) Solve the equation $e^{7x+2} = 2$, i.e., you must find x;

(ii) Solve the equation $\ln(4x) = 3$, i.e., you must find x;

(iii) Find $f'(3)$ if $f(x) = \cos(\frac{\pi}{2}e^{x-3})$.

5. [5 points] Find (if any) the inflection point(s) of $f(x) = e^x(x^2+1)$. When is f concave up? When is f concave down? Hint: construct a table including x, $f(x)$, $f''(x)$.

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• Problems require complete and clearly presented solutions and carry part marks if there is substantial correct work toward the solution.

1. [3 points] Find the derivative of the function $f(x) = \tan(4x) + \cos(3x) + \sin(x)$. Hint: recall that $\tan(x) = \frac{\sin(x)}{\cos(x)}$.

2. [3 points] Find the derivative of $h(x) = \frac{e^{7x}}{\sin(7x)}$.

3. [2 points] Find the equation of the tangent line to the graph of $f(x) = \cos(\sin(x)) + x$ at $(0, 1) = (0, f(0))$.

4. [7 points] (i) Solve the equation $e^{7x+1} = 4$, i.e., you must find x;

(ii) Solve the equation $\ln(3x) = 2$, i.e., you must find x;

(iii) Find $f'(2)$ if $f(x) = \cos(\frac{\pi}{2}e^{x-2})$.

5. [5 points] Find (if any) the inflection point(s) of $f(x) = e^x(x^2 - 1)$. When is f concave up? When is f concave down? Hint: construct a table including x, $f(x)$, $f''(x)$.