Name:_____

Math 105: Fall 2012
Quiz 3: October 15

Correct answers accompanied by incorrect or incomplete work will not receive full credit. Good Luck!

1. Find the derivatives of the following functions.

   (a) $f(x) = 7^x - e^x + \ln x + e^\pi$

   (b) $f(x) = 6\sin x + \frac{1}{2}\cos x$

2. Find the solution to the IVP: $y' = 7e^t - 8\sin t$, $y(0) = 5$.

3. Let $f(x) = \dfrac{x^4}{4} - \dfrac{2x^3}{3} + 12$.

(a) Prove that $x_1 = 0$ and $x_2 = 2$ are stationary points on f.

(b) In the following chart, circle the correct response (positive or negative). Justify your answers without drawing any graphs.

x	$(-\infty, 0)$	0	$(0, 2)$	2	$(2, \infty)$
$f'(x)$	on the interval $(-\infty, 0)$, $f'(x) =$ positive/negative		on the interval $(0, 2)$, $f'(x) =$ positive/negative		on the interval $(2, \infty)$, $f'(x) =$ positive/negative

(c) At $x = 0$, does $f(x)$ have a local maximum, local minimum, or neither? Use the chart in (b) to justify your answer.

(d) At $x = 2$, does $f(x)$ have a local maximum, local minimum, or neither? Use the chart in (b) to justify your answer.