Unit #3 Homework -- Curve Sketching

1. Find the x – coordinate of the absolute minimum of $f(x) = x^3 - x^2 - x + 1$ on the interval $[-2,2]$.

$x = -2$

2. On what interval(s) is the function $f(x) = x^3 - 2x^2$ increasing? Where is it decreasing?

$(-\infty, 0)$ $\quad (0, 4/3)$

$(4/3, \infty)$

3. Find the equation of the tangent line to the curve $y = e^x \ln x$ at the point where $x = 1$.

$y = e(x-1)$

4. Where does the function $f(x) = (4 - x^2)^{1/3}$ have a vertical tangent?

$x = 2$

$x = -2$

5. Let $f(x)$ be a continuous function with domain $[-7, 0]$ such that $f'(x) = 1 - x\cos(x) + \sin(x)e^x$.

a) Find any values of x for which $f(x)$ has a relative minimum. Justify your answer.

$x = -2.022$

b) Find any values of x for which $f(x)$ has a relative maximum. Justify your answer.

$x = -4.485$

c) Find the x-coordinates of any points of inflection of the graph of $f(x)$. Justify your answer.

$x = -6.437$

$x = -3.420$

$x = -.889$