MATH 113 Solutions for Quiz 3
19 November 2003 Wednesday

Question: Find the points where the function $f(x) = 2x^3 - 3x^2 - 12x + 1$, $x \in [-2, 4]$, take its absolute minimum and absolute maximum values.

Solution: $f'(x) = 6x^2 - 6x - 12 = 6(x+1)(x-2)$.
Critical points: $x = -1$, $x = 2$.
End points: $x = -2$, $x = 4$.
Calculus tells us that absolute min and absolute max will occur at one of these points only.
We calculate:

$$f(-2) = -3,\ f(-1) = 8,\ f(2) = -19,\ f(4) = 33.$$

Therefore the absolute min occurs at $x = 2$ and the absolute max occurs at $x = 4$.

The true to scale graph of the function is as follows: