Extreme WorkSheet

9. Find the absolute maximum and absolute minimum values of the function

$$f(x) = (x^2 - 1)^{2/3}$$

on the interval $[0, 3]$. Winter 2006

13. For the function defined by $f(x) = x^{2/3} - x + 1$, find: **May 2011**

a. $f(-1)$ and $f\left(\frac{125}{8}\right)$ (give exact answers using the fact that $2^3 = 8$ *and* $5^3 = 125$)

b. The absolute maximum and absolute minimum of f(x) on the interval $\left[-1, \frac{125}{8}\right]$

7. Find all critical numbers of $f(x) = (x^2 - 9)^3(3x + 5)^2$.

Autumn 2004

9. Find the absolute extrema of $f(x) = x^4 - 8x^2 + 7$ on $[-3, 1]$.

11. Find the largest and smallest values of the function $f(x) = (2x)^{2/3}(-x + 10) + 1$ on the interval $[-4, \frac{1}{2}]$.

13. Use the Mean Value Theorem to show that $\sqrt[3]{1+x} < 1 + \frac{1}{3}x$ for all $x > 0$. (If it helps, you may use the fact that this is equivalent to proving that $\sqrt[3]{1+x} - (1 + \frac{1}{3}x) < 0$ for all $x > 0$.) [May 2017]