

Math 151

Winter Quarter 2006

INCLASS WORK # 1

Attach all Work and Sign Off Below!

#	Last Name	First Name	Last 4 digits of SSN
1)			
2)			
3)			
4)			

1. Compute (multiply out) explicitly $(x + h)^2$, $(x + h)^3$, $(x + h)^4$, and $(x + h)^5$.

Your answer should be a sum of expressions of the form cx^ph^q where c is some constant.

2. Use (1.) to compute expressions $\frac{(x + h)^2 - x^2}{h}$, $\frac{(x + h)^3 - x^3}{h}$, $\frac{(x + h)^4 - x^4}{h}$, and $\frac{(x + h)^5 - x^5}{h}$.

Your answer should again be a sum of expressions of the form cx^ph^q where c is some constant.

3. Use (2.) to compute (if they exist) the limits $\lim_{h \rightarrow 0} \frac{(x + h)^n - x^n}{h}$ for $n = 2, 3, 4, 5$.

Before computing, decide which variables your answer should contain and depend on.

4. Make educated guesses how your answers above would look like for general $(x + h)^n$, $\frac{(x + h)^n - x^n}{h}$ and $\lim_{h \rightarrow 0} \frac{(x + h)^n - x^n}{h}$.

5. Show $\sqrt[3]{x + h} - \sqrt[3]{x} = \frac{h}{(\sqrt[3]{x + h})^2 + \sqrt[3]{x + h} \cdot \sqrt[3]{x} + (\sqrt[3]{x})^2}$ by explicit computation.

6. Use (5.) to compute $\lim_{h \rightarrow 0} \frac{\sqrt[3]{x + h} - \sqrt[3]{x}}{h}$