

Problem Set 3**Calculus 1****Due 10/27/03**

Each problem is worth 5 points. For full credit indicate clearly how you reached your answer.

1. Do the parabolas $y = -1 - x^2$ and $y = 1 + x^2$ have any tangent lines in common? Find equation(s) of any such lines, and explain why more cannot exist.

2. Suppose that on a surprisingly warm October day the high temperature of 87° occurs at exactly 4pm, with the low temperature of 49° having occurred at exactly 4am. Find a formula for a function that does a good job of representing the temperature throughout the day, and use it to find the rate at which the temperature is changing at 2pm.

3. Find $\lim_{x \rightarrow 0^+} x \ln x$.

4. Find $\lim_{x \rightarrow \infty} \left(x - \sqrt{x^2 - x} \right)$.