

MATH 1850 Sec 011 and 012

CALCULUS I

QUIZ 4

September 28, 2010

Name (Last, First) \_\_\_\_\_

1. Using the definition, calculate the derivative of the function. Then find the value of the derivative.

$$f(x) = 4 - x^2; \quad f'(-3)$$

$$f(x + h) = 4 - (x + h)^2 = 4 - (x^2 + 2xh + h^2)$$

$$\begin{aligned} \frac{f(x + h) - f(x)}{h} &= \frac{4 - (x^2 + 2xh + h^2) - (4 - x^2)}{h} \\ &= \frac{-2xh - h^2}{h} \\ &= -2x - h \end{aligned}$$

Now  $\lim_{h \rightarrow 0} -2x - h = -2x$ .

$$f'(-3) = -2 \cdot -3 = 6.$$