

Calculus Review Homework 2

due Thursday 9/6 at 2:30pm - please write neatly!

1) Find $\lim_{x \rightarrow 0} \frac{\sqrt{x+3} - \sqrt{3}}{x}$

2) For $f(x) = x^2 - x$, find $\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$.

3) Graph the curve and determine the discontinuities of \rightarrow

$$f(x) = \begin{cases} x-1, & x \leq 0 \\ x-2, & 0 < x < 3 \\ 4-x, & x \geq 3 \end{cases}$$

4) Find the slope of the tangent line to the curve

of $y = \frac{4}{x+1}$ at $x = 1$

5) Find the derivatives of the following functions at $x = 0$

a) $y = \sqrt{x^2 - 2x + 2}$

b) $y = (x-1)\sqrt{x^2 - 2x + 2}$

c) $y = \frac{x-1}{\sqrt{x^2 - 2x + 2}}$