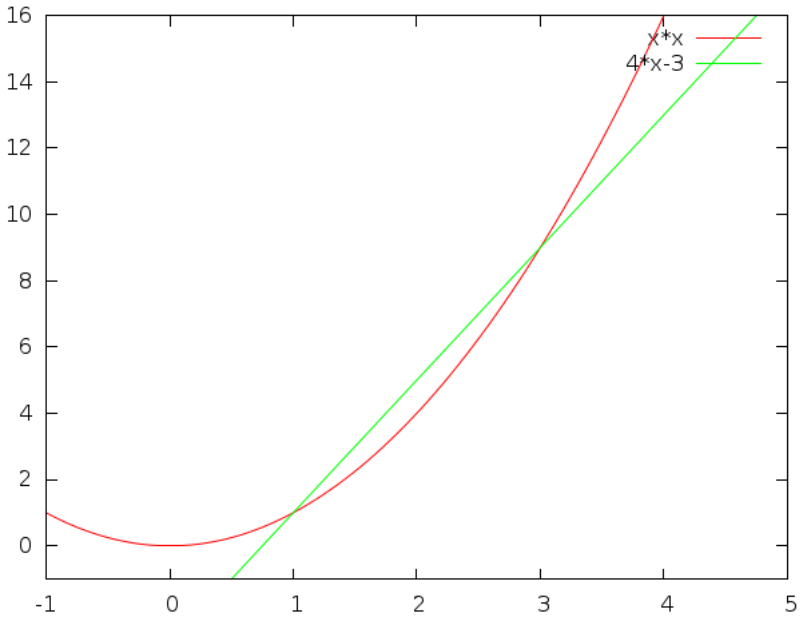
Math 100 – WORKSHEET 1
LIMITS

1. The slope of a graph



(1) Find the slope of the line through points $P(1,1)$ and $Q(x,x^2)$ where:
   (a) $x = 3$

   (b) $x = 1.1$

   (c) $x = 1.01$

   (d) $x = 1.001$

What is the slope of the line tangent to the curve at $P(1,1)$? What is its equation?

Date: 9/9/2021, Worksheet by Lior Silberman. This instructional material is excluded from the terms of UBC Policy 81.

2. Limits

(2) Evaluate $f(x) = \frac{x-3}{x^2-x-6}$ at $x = 2.9, 2.99, 2.999, 3.1, 3.01, 3.001$. What is $\lim_{x\to 3} f(x)$?

(3) Evaluate

(a) $\lim_{x\to 1} \sin(\pi x)$

(b) $\lim_{x\to 1} \frac{e^x(x-1)}{x^2+x-2}$.

(c) $\lim_{x\to 0} \frac{\sqrt{1+2x}-\sqrt{1+x}}{3x}$

(4) Either evaluate the limit or explain why it does not exist. Sketching a graph might be helpful.

(a) $\lim_{x\to 1} f(x)$ where $f(x) = \begin{cases} \sqrt{x} & 0 \le x < 1 \\ 3 & x = 1 \\ 2 - x^2 & x > 1 \end{cases}$.

(b) $\lim_{x\to 1} f(x)$ where $f(x) = \begin{cases} \sqrt{x} & 0 \le x < 1 \\ 1 & x = 1 \\ 4 - x^2 & x > 1 \end{cases}$.