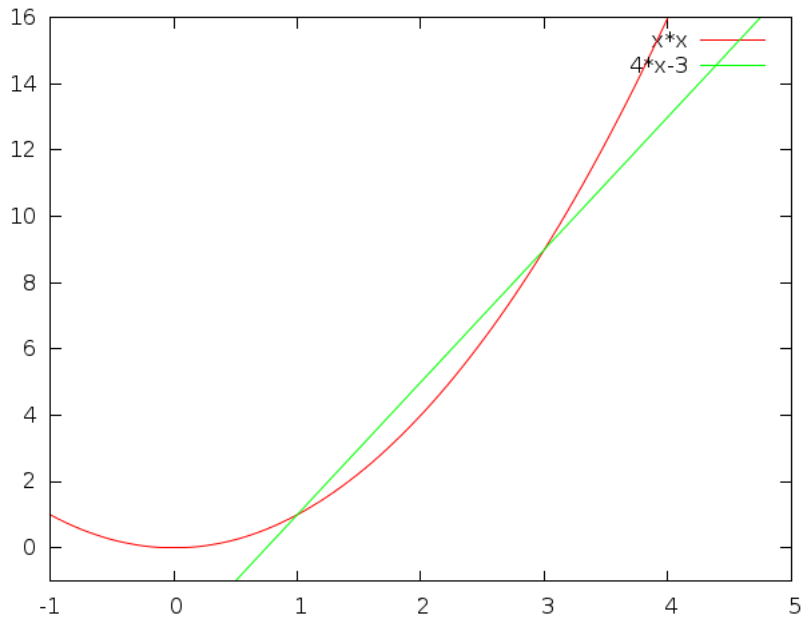


MATH 100 – WORKSHEET 1
TANGENT AND VELOCITY PROBLEMS

1. THE SLOPE OF A GRAPH



- (1) Find the slope of the line through $P(1, 1)$ 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 tangent line at $P(1, 1)$? What is its equation?

2. LIMITS

(1) 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 $\lim_{x \rightarrow 3} f(x)$?

(2) Evaluate

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

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

(3) Either evaluate the limit or explain why it does not exist

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

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