# Using Tangent Lines to Represent Curves
(Math 157; TBA #1)

It is possible to use tangent lines to show the shape of a curve. That is, instead of drawing the curve outright, one could sketch several tangent lines and let them suggest the shape of the curve. The following example is provided for the curve $y = x^3$ over the interval $0 \leq x \leq 3$.

x	y	y'	Equation for tangent line.
0	0	0	$y = 0$
0.5	0.125	0.75	$y = 0.75x - 0.25$
1	1	3	$y = 3x - 2$
1.5	3.375	6.75	$y = 6.75x - 6.75$
2	8	12	$y = 12x - 16$
2.5	15.625	18.75	$y = 18.75x - 31.25$
3	27	27	$y = 27x - 54$
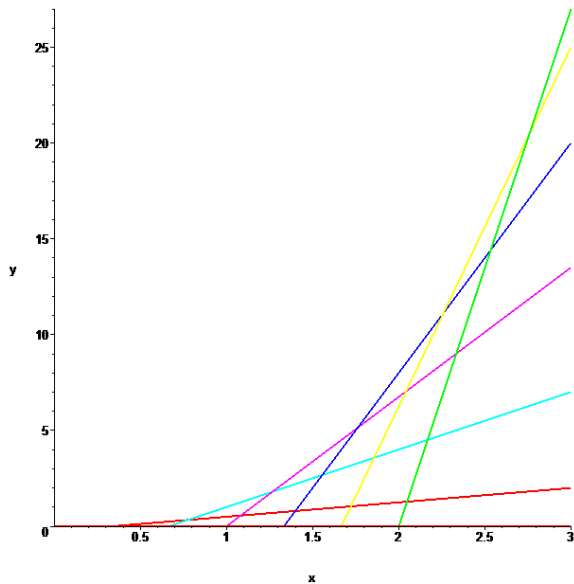
For each of the following functions, make a table like the one above (using the given values of x), and make a graph showing the resulting tangent lines. You may use computer software to make your graphs, or you can do it by hand. If you do it by hand, use graph paper and a straight edge so that your graphs look nice and are reasonably accurate.

1. $f(x) = x^2$ for $x = 0, 0.5, 1, 1.5, 2, 2.5, 3$
2. $g(x) = \dfrac{1}{x}$ for $x = 0.25, 0.5, 1, 1.5, 2, 2.5, 3$