

Name: _____

Worksheet 1 - lines and tangent lines

If you had trouble with question 1, do these problems.

1. Find the line through the points $(3, 0)$ and $(0, 2)$.

Method 1: If the slope is m , and the point (x_0, y_0) is on the line, one equation for the line is

$$y - y_0 = m(x - x_0).$$

Method 2: Cool fact: the line through $(a, 0)$ and $(0, b)$ can be written $x/a + y/b = 1$.

2. Find an equation for the line through $(4, 0)$ and $(0, -5)$.
3. Find an equation for the line through the points $(1, 1)$ and $(4, 5)$ using the first method.
4. Graph the lines $x + y = 1$ and $y - x = 1$.
5. Suppose that a right triangle has vertices $(0, 0)$, $(0, 10)$, and $(4, 0)$. How wide across is the triangle at height $y = 3$?
6. Find the equation of the tangent line to $f(x) = x^2$ at $x = 1$.
7. Plug $x = 1.1$ into your tangent line from the last problem. How close is the resulting y value to $f(1.1)$? Is the tangent line a good approximation to the curve near $x = 1$?
8. For which values of x does the tangent line approximation in the previous problem have error less than $1/10$?