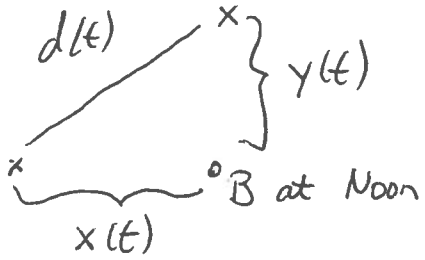
Name: Key

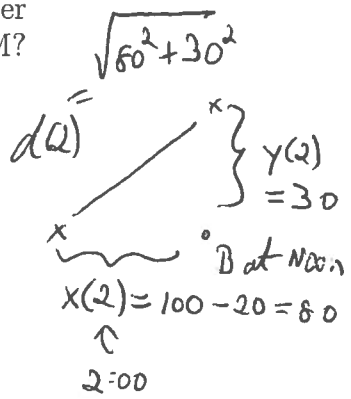
Math 1310-004
Quiz 8 (Boo!)
October 31, 2014

1. (5 points) At noon, ship A is 100 km west of ship B. Ship A is sailing east at 10 km per hour and ship B is sailing north at 15 km per hour. How fast is the distance between the ships changing at 2:00 PM?

$x'(t) = -10$
$y'(t) = 15$

A at Noon





$$d(t)^2 = x(t)^2 + y(t)^2 \;;\; 2d(t)d'(t) = 2x(t)x'(t) + 2y(t)y'(t)$$

$$d'(2) = \frac{x(2)x'(2) + y(2)y'(2)}{d(2)} = \frac{(80)(-10) + (30)(15)}{\sqrt{80^2+30^2}}$$

2. (5 points) Find the absolute (global) max and min of the function:

$$f(x) = x^2 - x + 1$$

on the interval $[-2, 2]$.

$f'(x) = 2x - 1$; $f'(c) = 0 \Leftrightarrow 2c - 1 = 0 \Leftrightarrow c = 1/2$

To check: $f(-2)$ (endpt.), $f(1/2)$ (critical), $f(2)$ (endpt.)

$f(-2) = 7$; $f(1/2) = 3/4$; $f(2) = 3$

$f(-2) = 7$ ← MAX

$f(1/2) = 3/4$ ← MIN