

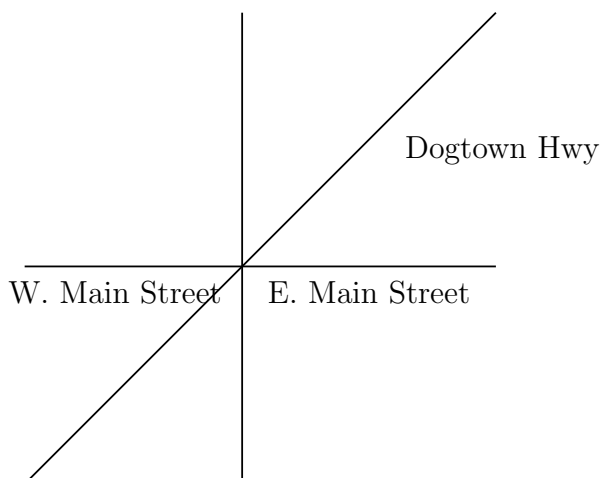
Assignment #6

Name _____

Due Wednesday, 18 October 2017

Use proper notation. Use complete sentences.

1. Main Street in the town of Cut-N-Shoot, Texas, runs east and west. In the center of town, the Dogtown Highway runs to the northeast, making a 45° angle with East Main Street; see the figure below. At noon, Alice leaves the center of town on the Dogtown Highway, heading northeast at 2 miles per hour. One hour later, Bob leaves the center of town on East Main Street, heading east at 3 miles per hour. At what rate is the distance between them changing at 4:00pm?
 - (a) Define the relevant variables for this problem.
 - (b) Express a relationship between these variables. (Hint: You may want to look up the law of cosines.)
 - (c) Express a relationship between the rates of change of these variables.
 - (d) Answer the question posed above.



2. In each case, find the critical numbers for the function f on the interval I .

(a) $f(x) = \sqrt{3}x + 2 \sin(x)$, $I = (-2\pi, 2\pi)$.

(b) $f(t) = (2t - 1)^4(3t - 7)^3$, $I = (-\infty, \infty)$.