

Quiz 5

Math 251

Name:

Show *all* your work (algebraically or geometrically) for each and simplify. No credit is given without supporting work.

1. [5] A particle moves according to the law of motion $s = f(t) = t^3 - 12t^2 + 36t$ for $t \geq 0$, where t is measured in seconds and s in feet. Answer the following questions:
 - (a) Find the velocity at time t .
 - (b) Find the total (not the net, but *total*) distance the particle moved in the first 8 seconds.

2. [5] At noon, ship A is 100km west of ship B. Ship A is sailing south at 35 km/h and ship B is sailing north at 25 km/h. How fast is the distance between the ships changing at 4:00pm?

(a) Draw a picture of the situation for any time t . Assign variable names to quantities in the picture that you think you might be useful.

(I did not ask for a picture at a particular time, but at some unspecified time t ! 4:00 is a *particular* time.)

(b) What is the unknown? Write this down using the notation we've developed for this class.

(c) Find an equation relating the quantities you introduced in part (b).

(d) Finish solving the problem.