

Math 124, Winter 2012, Quiz 1

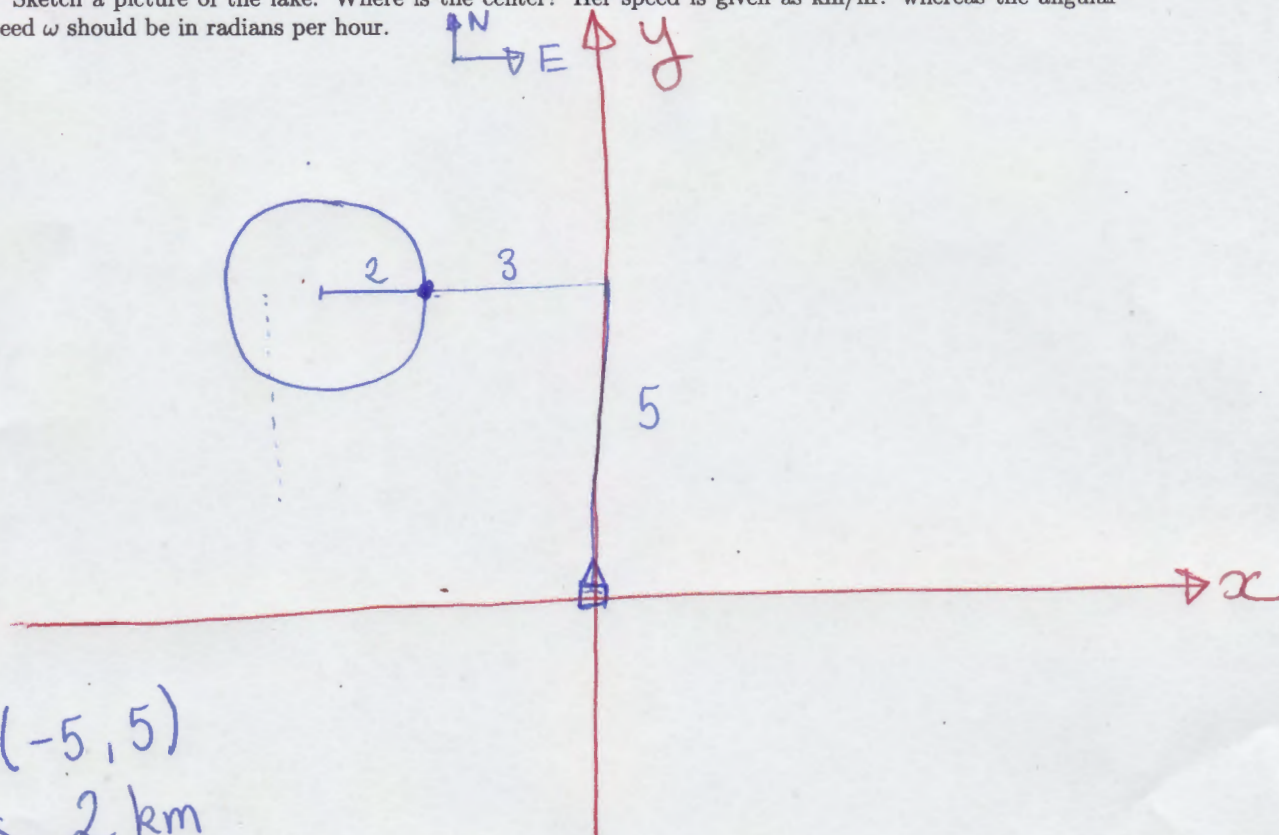
January 10, 2012

Name Solutions

TA/Section \_\_\_\_\_

Jane is running around a circular lake of radius 2 km at a speed of 12 km/hr. At  $t = 0$ , she starts running at the easternmost point of the lake; 5 km north and 3 km east from her house. Give parametric equations for Jane with a coordinate system with the positive  $x$ -axis pointing East, the positive  $y$ -axis pointing North and Jane's house at the origin.

Sketch a picture of the lake. Where is the center? Her speed is given as km/hr. whereas the angular speed  $\omega$  should be in radians per hour.



center  $(-5, 5)$   
radius 2 km

linear speed  $v = 12$  km/hr

$v = \omega r \rightarrow$  angular speed

$$\omega = \frac{v}{r} = \frac{12}{2} = 6 \text{ rad/hr.}$$

$$x = -5 + 2 \cos(6t)$$

$$y = 5 + 2 \sin(6t)$$