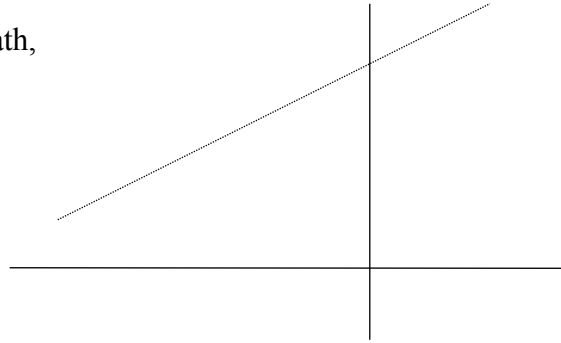


### Notes 13.5 Parametric Equations for Moving Objects

1. A ship moves with an eastward velocity of 21 km/hr and a northward velocity of 13 km/hr. At time  $t = 0$  hour the ship is at the point  $P_0(-43, 19)$ , where the distances are in kilometers from a lighthouse. See picture.

- a) Find parametric equations for the ship's path, using  $t$  hours as the parameter.



- b) Predict the time when the ship will be 60 km north of the lighthouse.  
c) How far east or west of the lighthouse will it be at this time?

2. Calvin is walking at a speed of 6 ft/sec along a path that makes an angle of  $55^\circ$  with the x-axis. At time  $t = 0$  he is at the point  $(263, 107)$ , where the distances are in feet from a particular traffic light. See picture.

- a) What are Calvin's speeds in the x- and y-directions?
- b) Write parametric equations for his position as a function of the parameter  $t$  seconds.
- c) A street goes along the x-axis. Assuming Calvin was walking at his 6 ft/sec pace before  $t = 0$ , at what time  $t$  did he cross the street?
- d) How far from the light does the path cross the street?