Exploration 6

Name_____

For the problems below, distances are measured in meters and time is measured in seconds.

1. A particle at point $P_0(-1, 2, 1)$ at time $t = 0$ has velocity $\boldsymbol{v} = \langle 2, -1, 2 \rangle$. The speed of the particle (in meters per second) is given by the magnitude $\boldsymbol{v}$.

   (a) How fast is the particle going?

   (b) Find a unit vector in the direction of $\boldsymbol{v}$.

   (c) Where is the particle when it has travelled a distance of 11 meters from point P_0? What is the time when it is at this location?

   (d) Where will the particle be at time $t = 3$ seconds?

   (e) Where was the particle at time $t = -2$ seconds?

   (f) Find parametric equations for the path of the particle.

2. A particle is moving at constant velocity through space. Its position at time $t = 2$ seconds is $(2, 3, -2)$ and its position at time $t = 5$ seconds is $(1, -1, 6)$.

   (a) How fast is the particle moving?

   (b) What is the velocity of the particle?

   (c) Where was the particle at time $t = 0$?

   (d) Find parametric equations for the path of the particle.