

Mathematics 11
Fall 2012
Written Homework Assignment 1
Sample Solution

Problem: A particle begins at position \vec{p} and moves with constant velocity \vec{v} (in units per second). Find the particle's position after t seconds.

Solution: The distance the particle travels is the product of the speed $|\vec{v}|$ with the elapsed time t , or $t|\vec{v}|$. The displacement is the vector that points in the direction of motion, the direction of \vec{v} , and whose length is the distance traveled, $t|\vec{v}|$; this vector is $t\vec{v}$. The new position is the initial position plus the displacement,

$$\boxed{\vec{p} + t\vec{v}}.$$