Module 03 - Lesson 2

Acceleration in Two Dimensions

Question 1: A bike's velocity is given by $\vec{v} = ct^3\hat{\imath} + d\hat{\jmath}$ where t is time, $c = 2.5 \text{ ms}^4$, and $d = -1.5$ m/s. What is the magnitude and direction of the bike's acceleration?

Question 2: An ice skater is gliding along at 3.0 m/s for a while and then she undergoes an acceleration of magnitude 1.2 m/s^2 along her direction of motion for 3.0 s. Find the magnitude of the final velocity.

Problem: A cat chasing a mouse is moving at a velocity of 4.00 m/s due East at one moment and at 4.80 m/s North 4.00 s later. Find (a) the x and y components of the cat's average acceleration during that time and (b) the magnitude and direction of the cat's average acceleration during that time.