

# Monday Reading Assessment: Unit 2

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## 1 Chapter 4

1. Imagine a system propagating through 3D space with a velocity vector  $\vec{v} = (2t - 1)\hat{i} + 2\hat{j} + (-3t + 2)\hat{k}$ . Is the object accelerating? Why or why not?
2. Suppose a car is being pulled out of a ditch by a truck. The car moves up the ditch at an angle of 45 degrees. Which of the following is the likely acceleration vector? Draw a diagram of the acceleration vector as a visual tool.
  - A:  $\vec{a} = (2\hat{i} + 2\hat{j}) \text{ m/s}^2$
  - B:  $\vec{a} = (2\hat{i} + 2\hat{j}) \text{ m/s}$
  - C:  $\vec{a} = (2\hat{i} - 2\hat{j}) \text{ m/s}^2$
  - D:  $\vec{a} = (-2\hat{i} + 2\hat{j}) \text{ m/s}^2$
3. Imagine you are launching a projectile with a cannon that can tilt to any angle between 0 and 90 degrees. What angle maximizes the *range*? Why?
4. If an object has a constant x-component of velocity and suddenly experiences an acceleration at an angle of 70 degrees with respect to the x-direction, does the x-component of velocity change? Why or why not?