

Calculating Acceleration

Guided Practice (direction changes)

A baseball is thrown 15 m/s [W] and 5.6 s later it is moving 21 m/s [E]. Calculate the average acceleration of the baseball.

Reread question and set up the coordinate system



Reread question and list known/wanted quantities - make quantities relative to positive direction

$$\vec{v}_0 = -15 \text{ m/s [E]}, \quad \vec{v}_f = 21 \text{ m/s [E]}$$

$$t = 5.6 \text{ s} \quad \vec{a} = ?$$

Check for a formula using only the known and wanted quantities

$$\vec{a} = \frac{\vec{v}_f - \vec{v}_0}{t}$$

Substitute values and solve for the unknown

$$\vec{a} = \frac{(21) - (-15)}{5.6}$$

$$\vec{a} = \frac{36}{5.6} = 6.4 \text{ m/s}^2 \text{ [E]}$$

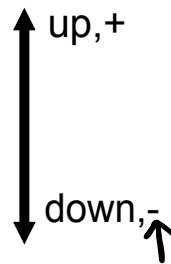
Check answer conceptually - does its value and direction make sense?

Calculating Acceleration

Guided Practice (direction changes)

A dime is thrown upwards with a velocity of 35 m/s. Calculate the velocity of the dime 5.0 s later (no air resistance).

Reread question and set up the coordinate system



Reread question and list known/wanted quantities - make quantities relative to positive direction huh?! What is acceleration?! This is stupid, I'm outta here.

$$\vec{v}_0 = 35 \text{ m/s [up]} \quad \vec{v}_f = ?$$

$$t = 5.0 \text{ s} \quad \vec{a} = -9.81 \text{ m/s}^2$$

Check for a formula using only the known and wanted quantities

$$\vec{a} = \frac{\vec{v}_f - \vec{v}_0}{t}$$

Substitute values and solve for the unknown

$$\underline{-9.81} \times 5.0 = \frac{v_f - 35}{5.0} \times 5.0$$

$$-49 \times 35 = v_f - 35 \times 35$$

$$\boxed{-14 \text{ m/s} = \vec{v}_f}$$

Check answer conceptually - does its value and direction make sense?

Attachments

moving-man_all.jar