Calculating Acceleration

Guided Practice (no direction changes)

Solving for initial velocity

A plane accelerates to 175 m/s [E] under an acceleration of 15 m/s^2 [E] in 12.5 seconds. Calculate the initial velocity of the plane.

Reread question and list known/wanted quantities

$\vec{v}_f = 175\ m/s$

$\vec{a} = 15\ m/s^2$

$t = 12.5\ s$

$\vec{v}_0 = ?$

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

$$15 = \frac{175 - v_0}{12.5} \quad \times 12.5 \quad \times 12.5$$

$$187.5 = 175 - v_0 \quad -175 \quad -175$$

$$\frac{12.5}{-1} = \frac{-v_0}{-1}$$

$$-12.5\ m/s = \vec{v}_0$$

West, not east

Calculating Acceleration

Guided Practice (no direction changes)

Solving for time - weakest student performance on this type

Calculate how long it would take a person to accelerate from rest to 22 m/s [E] averaging an acceleration of 1.8 m/s^2 [E].

Reread question and list known/wanted quantities

$t = ?$

$\vec{v}_0 = 0\ m/s$

$\vec{v}_f = 22\ m/s$

$\vec{a} = 1.8\ m/s^2$

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

$$1.8 = \frac{22 - 0}{t}$$

$$1.8 \times t = \frac{22}{t} \times t$$

$$1.8t = 22$$

$$t = \frac{22}{1.8}$$

$$t = 12.2\ s$$

Attachments

moving-man_all.jar