

No clickers & yes calculators.

OPENER:

Difference in:

1) Impulse & Momentum

2) Closed system & Isolated system

Apr 18-9:47 AM

9.2 More Conservation of Momentum

Use pg. 238 - 239 to write notes

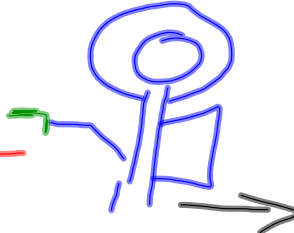
Recoil:

Propulsion in Space:

Apr 18-9:54 AM

## Example 1:

An astronaut at rest in space fires a thruster pistol that expels 35g of hot gas at 875 m/s. The combined mass of the astronaut and pistol is 84 kg. How fast and in what direction is the astronaut moving after firing the pistol?

$$\begin{aligned}
 &V_{pi} = 0 \text{ m/s} & m_p &= .035 \text{ kg} \\
 &V_{ai} = 0 \text{ m/s} & V_{fp} &= 875 \text{ m/s} \\
 & & m_a &= 84 \text{ kg}
 \end{aligned}$$


$$\begin{aligned}
 0 &= p_{pf} + p_{af} \\
 -p_{pf} &= p_{af} \\
 -m_p V_{fp} &= m_a V_{af} \\
 \frac{-(.035)(-875)}{84} &= V_{af} \\
 &= .36 \text{ m/s}
 \end{aligned}$$

Apr 18-9:59 AM

## Example 2:

An astronaut at rest in space fires a thruster pistol that expels 35g of hot gas at 875 m/s. The combined mass of the astronaut and pistol is 62 kg. How fast and in what direction is the astronaut moving after firing the pistol?

$$0.49 \text{ m/s}$$

Apr 18-10:01 AM

Example 3:

A 5.00 kg model rocket is launched at a speed of 645 m/s, spewing 40.0 g of burned fuel from its exhaust. What is the velocity of the rocket after the fuel has burned? IGNORE any EXTERNAL FORCES

$$m_{rf} = 5.00 - .04 = 4.96 \text{ kg}$$

$$v_{fi} = 0 \text{ m/s}$$

$$v_{ri} = 0 \text{ m/s}$$

$$-P_{ff} = P_{rf}$$

$$-m_f \cdot v_{ff} = m \cdot v_{rf}$$

$$\frac{-(.04)(645)}{4.96} = \frac{4.96(v_{rf})}{4.96}$$

$$5.2 \text{ m/s}$$

Apr 18-10:01 AM

① Pg. 240 19-21

② 9.2 Transparency

③ Test Corrections  
Due Friday

Apr 18-1:28 PM