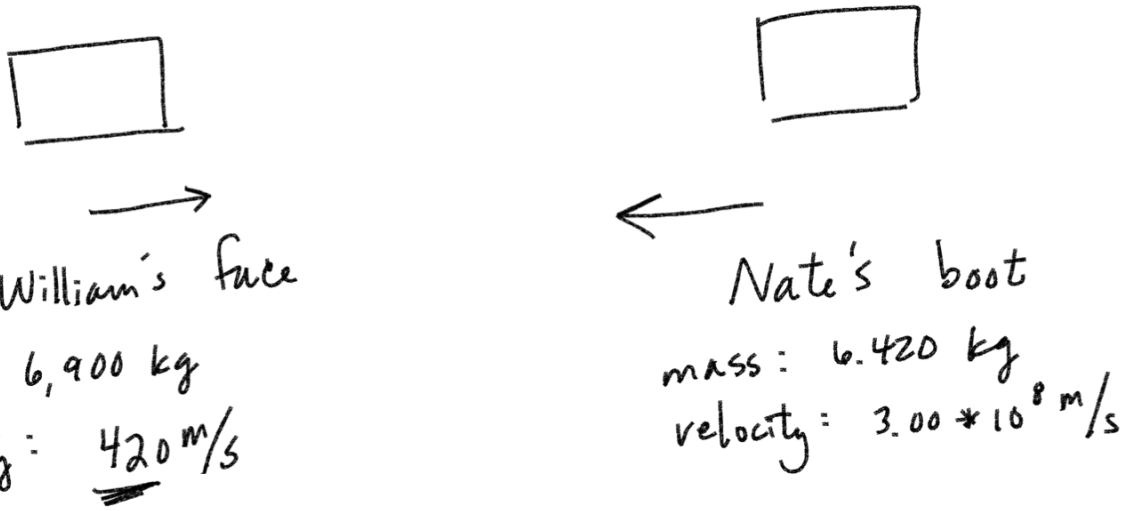
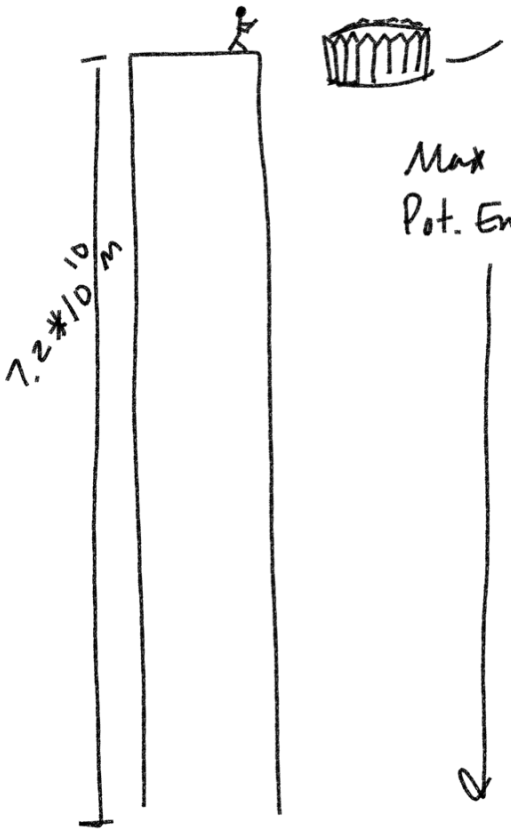
W-GP General Physics Week 31



$$\frac{m_1 v_1 + m_2 v_2}{(m_1 + m_2)} = \frac{(m_1 + m_2) v_f}{(m_1 + m_2)}$$

$$v_f = \frac{m_1 v_1 + m_2 v_2}{(m_1 + m_2)} = \frac{(6900)(420) + (6.420)(-3.00 * 10^8 \text{ m/s})}{(6900 + 6.420)}$$

$\boxed{-280{,}000 \text{ m/s}}$ $= -278{,}704$ or $-278{,}451$



Nate's burial Reese's Cup

mass: 20,000,000 kg

Max Pot. Energy = mgh

$\frac{1}{2}mv^2$

kinetic energy

$mgh = \frac{1}{2}mv^2$

initial final

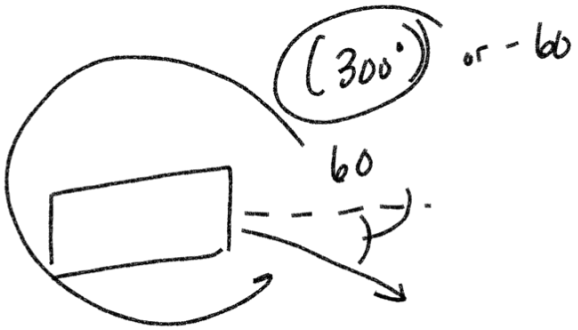
$2(gh) = \left(\frac{1}{2}v^2\right)2$

$\sqrt{2gh} = \sqrt{v^2}$

$v = \sqrt{2gh}$

$v = \sqrt{2(9.8\ m/s^2)(7.2 * 10^{10}\ m)}$

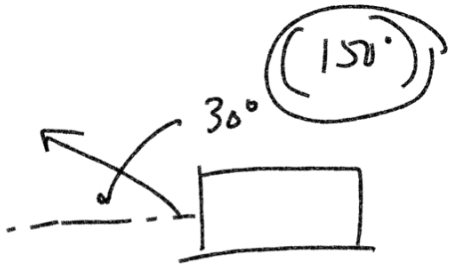
$= 1,187,939\ m/s$



Cooper's fingers

mass: 212 kg

velocity: 6940 m/s



Cooper's Mittens

mass: 16 kg

velocity: 2098 m/s

$m_1 v_1 + m_2 v_2$

x comp

$\{ 212\,kg(6940 \cos 300^\circ) + 16\,kg(2098 \cos 150^\circ) \}^2$

$(706569)^2$

y comp

$212(6940 \sin 300^\circ) + 16(2098 \sin 150^\circ)$

$(-1,257,381)^2$

$r = \sqrt{(x\,comp)^2 + (y\,comp)^2}$

$r = 1,442,306$ kg m/s

$(212 + 16)$

6,325.9 m/s

$360 + 60 = 300^\circ$

$\tan^{-1} \frac{y\,comp}{x\,comp}$

$\tan^{-1} \frac{-1257381}{706569}$

-60°

6325.9, 300°

HW

HW Q 28 today

HW Q 29 & May 23rd

HW Q 30

optional HW 31 Ch 5-9 Review

Pre-Test

Test 5-9 May 23rd

if you have an A, you're good!