

Monday, November 18/13  
Physics 112/111

Midterm - Wed., Nov. 20

Operation Christmas Child

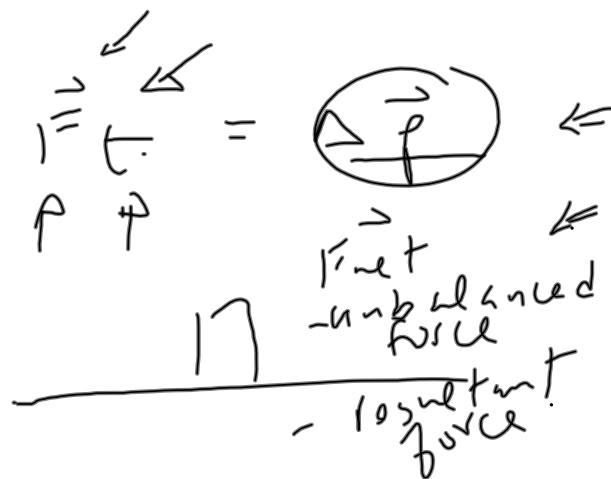
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1. Check -> ICA - C4, 5 and 10
  2. Questions re Midterm?
  3. Unit 3 - Work, Power and Energy - Start Chapter 6
- 



ICA - C4, 5 and 10

1. B
2. C
3. A
4. C
5. B
6. B
7. D
8. B
9. D
10. C



$$N_s = kg \frac{m}{s} \cdot s$$

$$kg \frac{m}{s}$$

$$\Delta p = \vec{F} t = \vec{J}$$

$$\vec{F} t = \Delta p$$

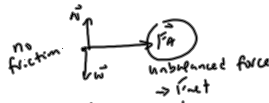
$$t = \frac{\Delta p}{\vec{F}}$$

Part 2.

1.  $\vec{v}_f = 1.6 \text{ m/s}$   $\Rightarrow$

WS  $\Rightarrow$  the final velocity is 1.6 m/s, right.

$\vec{a} = 0.542 \text{ m/s}^2$   $\leftarrow$  intermediate gSD



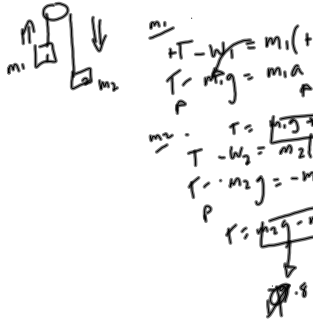
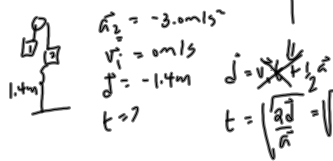
$F_{\text{net}} = m\vec{a}$   
 $\vec{a} = \boxed{\phantom{0.542}}$

$v_i = 0 \text{ m/s}$   
 $\vec{a} = 0.542 \text{ m/s}^2$   
 $\vec{d} = 12.3 \text{ m}$   
 $\vec{v}_f = ?$   
 $v_f^2 = v_i^2 + 2\vec{a}\vec{d}$

2. a)  $\vec{a}_1 = +3.0 \text{ m/s}^2$

WS  $\Rightarrow$  3.0 m/s<sup>2</sup> up.

b)  $t = 0.97 \text{ s}$  0.96 | ...



4. a)  $\vec{a}_1 = -0.695 \text{ m/s}^2$

b)  $t = 2.0 \text{ s}$

3.  $m = 25 \text{ kg}$   $\vec{a} = ?$

$\vec{F}_f \leftarrow$

$F_{\text{net}} = m\vec{a}$

$\left\{ \begin{aligned} F_A - F_f &= ma \\ F_A - mN &= ma \\ F_A - mW &= ma \\ F_A - mg &= ma \end{aligned} \right.$   $\left[ \begin{aligned} F_A \\ W \end{aligned} \right]$

$F_A = mg + ma$   
 $F_A = m(mg + a)$   
 $m = \frac{F_A}{mg + a}$   
 $m = 25 \text{ kg}$

4. a)  $\vec{J} = -5.4 \text{ kg m/s}$

$m = 0.27 \text{ kg}$   
 $v_i = 6.0 \text{ m/s}$   
 $v_f = -14 \text{ m/s}$   
 $\vec{J} = ?$

$\vec{J} = m(v_f - v_i)$   
 $\vec{J} = 0.27(-14 - 6)$   
 $\vec{J} = -5.4 \text{ kg m/s}$

## Physics 112/111 - Midterm Outline

- > ~~Resultant~~
- > Velocity-Time Graph ✓
- > Kinematic Problems Including Freely Falling Bodies
- > Force Problem C4 ✓
- > Force Problem C5 ✓ involve a kinematic formula.
- > Force Problem C10. ✓ involve a kinematic formula.
- > Momentum, Impulse, Momentum-Impulse Theorem ✓

FBDs

$$\vec{p} = m\vec{v}, \quad \vec{v} = \vec{F}t, \quad \vec{F}t = \Delta\vec{p}$$
$$\vec{J} = \vec{F}t = \boxed{\Delta\vec{p}} = \vec{p}_f - \vec{p}_i = m\vec{v}_f - m\vec{v}_i = m\boxed{\Delta\vec{v}}$$

\* Formula sheet will be provided.

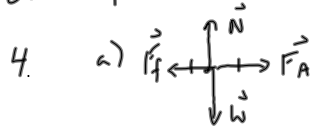
\* Format: Problems only (6)

## Review #2 - Answers.

1. a)  $0 \text{ kgm/s}$   
 b)  $1.7 \text{ kgm/s}$   
 c)  $5.7 \times 10^2 \text{ N}$

\* 2.  $\vec{a} = +3.54 \text{ m/s}^2$

3.  $\vec{v}_i = +849 \text{ m/s}$



b)  $\mu = 0.21$

5. (i) a) uniform motion  
 b) uniform motion  
 c) no motion

(ii) south

(iii)  $t = 3 \text{ s}$  and  $t = 10 \text{ s}$

6.  $\vec{v}_i = 4.0 \text{ m/s}$

7.  $\vec{F}_A = 44 \text{ N, right}$

8.  $\vec{R} = 69 \text{ N, } 34^\circ \text{ S of E or } 56^\circ \text{ E of S}$

9.  $m = 65 \text{ kg}$

10.  $\mu = 0.53$

11. 1.  $13 \text{ m/s, S}$      5.  $8.0 \text{ s}$   
 2.  $3.7 \text{ m/s}^2, \text{ N}$      6.  $3.7 \text{ m/s, S}$   
 3.  $7.5 \text{ m/s}$   
 7.  $9.4 \text{ m/s}$

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Review Prob. for Midt.

# 8.  $0.92 \text{ s}$

## Attachments

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