

ACADEMIC MIDTERM EXAM 2014

Mr. Haine's Class	Section	in	Proctor
AP Physics	3	D25	Conahan
Academic Physics	1	D26	Hood
Academic Physics	2	D27	T. Stokes
Academic Physics	3	D29	Rovner
Academic Physics	4	D31	R. Perlman

58 calculation problems - 42 concept
Bring a Calculator - Bring a Pencil - Equations Provided

EQUATIONS

$x = x_i + vt + \frac{1}{2}at^2$	$v_f^2 = v_i^2 + 2ad$	$v_f = v_i + at$
$w = mg$	$F_g = \frac{Gm_1m_2}{r^2}$	
$F = ma$	$F_f = \mu N$	
$\tau = Fr \sin \theta$	$a_c = \frac{v^2}{r}$	$\tau = \frac{mv^2}{r}$
$p = mv$	Impulse = $F \times t$	
$F \times t = \Delta(mv)$		
$W = Fd$	$E_p = \frac{W}{r}$	
$KE = \frac{1}{2}mv^2$	$PE = mgh$	$PE = \frac{1}{2}kx^2$

$$x = x_i + vt + \frac{1}{2}at^2$$

$$v_f = v_i + at$$

$$v_f^2 = v_i^2 + 2ad$$

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$$w = mg$$

$$F_g = \frac{Gm_1m_2}{r^2}$$

$$G = 6.67 \times 10^{-11} (Nm^2/kg^2)$$

$$g = 9.8m/s^2$$

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$$p = mv$$

$$\text{Impulse} = F \times t$$

$$F \times t = \Delta(mv)$$

EQUATIONS

$s = ut + \frac{1}{2}at^2$ $v_f^2 = v_i^2 + 2ad$ $v_f = v_i + at$
 $u = \frac{mg}{\mu}$ $F_g = \frac{Gm_1m_2}{r^2}$
 $g = 9.8 \text{ m/s}^2$ $G = 6.67 \times 10^{-11} \text{ (Nm}^2/\text{kg}^2)$
 $F = ma$ $F_g = \mu N$
 $\tau = Fr \sin \theta$ $\alpha = \frac{\tau}{I}$ $\epsilon = \frac{\Delta v}{\Delta t}$
 $\mu = mv$ $\text{Impulse} = F \times t$
 $F \times t = \Delta(mv)$
 $W = Fd$ $E = \frac{W}{t}$
 $\text{Eff} = \frac{\text{Work}_{\text{out}}}{\text{Work}_{\text{in}}}$
 $\text{KE} = \frac{1}{2}mv^2$ $PE = mgh$ $PE = \frac{1}{2}kx^2$

$$W = Fd$$

$$P = \frac{W}{t}$$

$$\text{Eff} = \frac{\text{Work}_{\text{out}}}{\text{Work}_{\text{in}}}$$

$$\text{Eff} = \frac{\text{Power}_{\text{out}}}{\text{Power}_{\text{in}}}$$

EQUATIONS

$s = ut + \frac{1}{2}at^2$ $v_f^2 = v_i^2 + 2ad$ $v_f = v_i + at$
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$$\text{KE} = \frac{1}{2}mv^2$$

$$PE = mgh$$

$$PE = \frac{1}{2}kx^2$$

VOCABULARY TERMS FROM THE TEXT

- Physics
- Dimensional analysis
- Significant digits
- Scientific method
- Hypothesis
- Scientific law
- Scientific theory
- Measurement
- Precision
- Accuracy
- Parallax
- Independent variable
- Dependent variable
- Line of best fit
- Direct relationship
- Quadratic relationship
- Inverse relationship

VOCABULARY TERMS FROM THE TEXT

- Motion diagram
- Coordinate system
- Origin
- Position
- Distance
- Magnitude
- Vector
- Scalar
- Resultant
- Time interval
- Displacement
- Position-time graph
- Instantaneous position
- Average velocity
- Average speed
- Instantaneous velocity

VOCABULARY TERMS FROM THE TEXT

- Velocity-time graph
- Acceleration
- Average acceleration
- Instantaneous acceleration
- Free fall
- Acceleration due to gravity

VOCABULARY TERMS FROM THE TEXT

- Force
- Free-body diagram
- Net force
- Newton's second law
- Newton's first law
- Inertia
- Equilibrium
- Apparent weight
- Weightlessness
- Interaction pair
- Newton's third law
- Tension
- Normal force

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VOCABULARY TERMS FROM THE TEXT

- Component
- Vector resolution
- Kinetic friction
- Static friction
- Coefficient of kinetic friction
- Coefficient of static friction
- Projectile
- Trajectory
- Uniform circular motion
- Centripetal acceleration
- Centripetal force

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VOCABULARY TERMS FROM THE TEXT

- Gravitational force
- Law of universal gravitation
- Lever arm
- Torque
- Center of mass
- Impulse
- Momentum
- Impulse-momentum theorem
- Closed system
- Isolated system
- Law of conservation of momentum

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VOCABULARY TERMS FROM THE TEXT

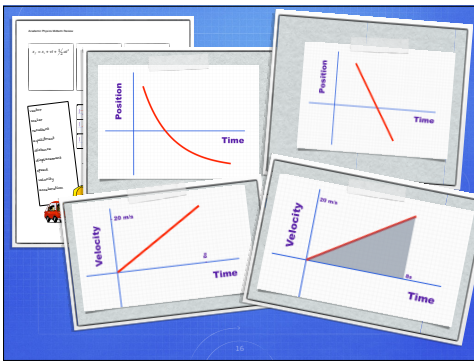
- Work
- Energy
- Kinetic energy
- Work-energy theorem
- Joule
- Power
- Watt
- Machine
- Effort force
- Resistance force
- Mechanical advantage
- Ideal mechanical advantage
- Efficiency
- Compound machine

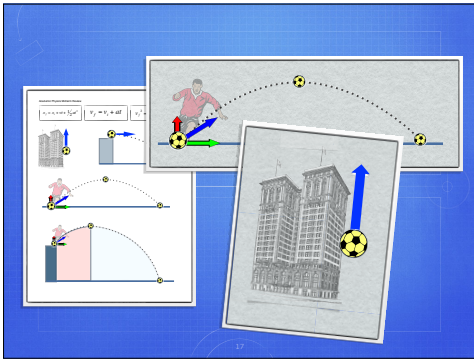
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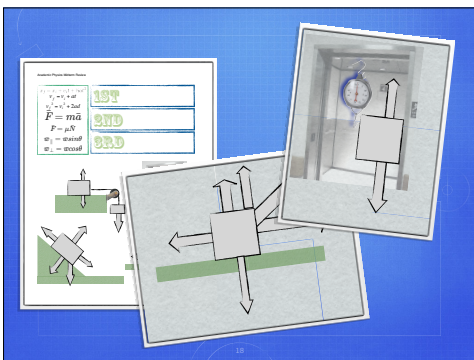
VOCABULARY TERMS FROM THE TEXT

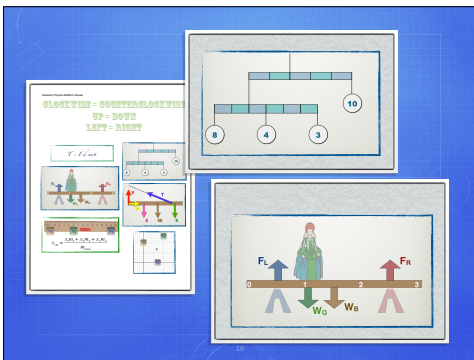
- Kinetic energy
- Gravitational potential energy
- Reference level
- Elastic potential energy
- Law of conservation of energy
- Mechanical energy
- Thermal energy
- Elastic collision
- Inelastic collision

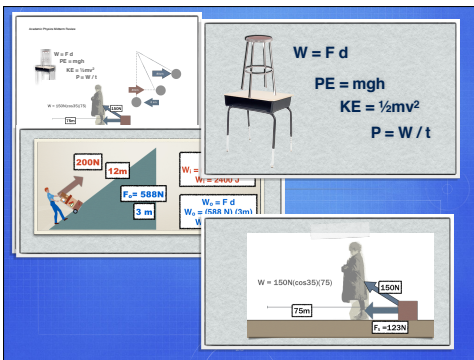
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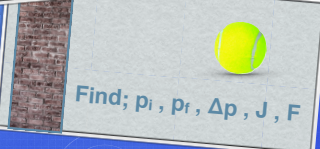








From Conservation of Momentum

$$5(10) + 7(-15) = 5v_{af} + 7(4)$$


Find; p_i , p_f , Δp , J , F
