MIDTERM EXAM 2012

Review
You already have a 3%
55 calculation problems - 45 concept

1

EQUATIONS ON THE SHEET

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

$$v_f = v_i + at$$

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

Do you remember which problems go with each equation?

2

EQUATIONS ON THE SHEET

$$w = mg \qquad F_g = \frac{Gm_1m_2}{r^2}$$

$$g = 9.8 m/s^2 \qquad G = 6.67 \times 10^{11} (Nm^2/kg^2)$$

Do you remember which problems go with each equation?

3

EQUATIONS ON THE SHEET

$$F = ma$$

$$F_f = \mu N$$

$$\tau = Fr\sin\theta$$

$$F_c = \frac{mv^2}{r}$$

$$a_c = \frac{v^2}{r}$$

Do you remember which problems go with each equation?

4

EQUATIONS ON THE SHEET

$$p = mv$$

$$Impulse = F \times t$$

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

Do you remember which problems go with each equation?

5

EQUATIONS ON THE SHEET

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

$$Eff = \frac{Power_{out}}{Power_{in}} \qquad Eff = \frac{Work_{out}}{Work_{in}}$$

Do you remember which problems go with each equation?

6

EQUATIONS ON THE SHEET

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh$$

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

Do you remember which problems go with each equation?

7

TEXTBOOK TERMS

- 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

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TEXTBOOK TERMS

- 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

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TEXTBOOK TERMS

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

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TEXTBOOK TERMS

- 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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TEXTBOOK TERMS

- 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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TEXTBOOK TERMS

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

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TEXTBOOK TERMS

- 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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TEXTBOOK TERMS

- 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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INSUFFICIENT CLUES

- ... that has __ significant digits ...
- ... a small boat travels **##.#** km north and then travels **##.#** km east ...

What do you think the rest of the question looks like?

16

INSUFFICIENT CLUES

- Which type of relationship do ...
- The slope of an object's position-time graph is ...

What do you think the rest of the question looks like?

17

INSUFFICIENT CLUES

- ... what is the person's displacement for the trip?
- ... accelerates from rest to **##.#** m/s in a distance of ...

What do you think the rest of the question looks like?

18

INSUFFICIENT CLUES

- ... her average acceleration is _____.
- ... maintains a constant velocity of **##.#** m/s for a distance of **##.#** m ...

What do you think the rest of the question looks like?

19

INSUFFICIENT CLUES

- ... falls from a bridge into the river below.
- ... initial horizontal velocity is **##.#** m/s, how far from the building is ...

What do you think the rest of the question looks like?

20

INSUFFICIENT CLUES

- ... string in a horizontal circle above her head ...
- ... the wall pushes back against ...

What do you think the rest of the question looks like?

21

INSUFFICIENT CLUES

- ... force of kinetic friction between a box ...
- ... rides in an elevator that accelerates ...

What do you think the rest of the question looks like?

22

INSUFFICIENT CLUES

- and the answers are ...
  - a. Diagram 1
  - b. Diagram 2
  - c. Diagram 3
  - d. Diagram 4
- What is the net force on ...
- ... magnitude of the resultant vector ...

What do you think the rest of the question looks like?

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INSUFFICIENT CLUES

- ... component of the weight parallel ...
- and the answers are ...
  - a. directly proportional
  - b. inversely proportional
  - c. independent of each other
  - d. equal

What do you think the rest of the question looks like?

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INSUFFICIENT CLUES

- ... in uniform circular motion ...
- ... what is the gravitational pull ...
- Impulse equals ...

What do you think the rest of the question looks like?

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INSUFFICIENT CLUES

- and the answers are
  - a. force
  - b. isolation
  - c. propulsion
  - d. recoil
- and the answers are
  - a. efficiency
  - b. ideal mechanical advantage
  - c. mechanical advantage
  - d. power

What do you think the rest of the question looks like?

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INSUFFICIENT CLUES

- ... an ideal machine ...
- ... is its kinetic energy ...
- ... how much torque does ...
- and the answers are...
  - a. distance
  - b. force
  - c. mass
  - d. time

What do you think the rest of the question looks like?

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INSUFFICIENT CLUES

- ... ball strikes a wall with a velocity of ...
- The two cars become stuck together and slide ...

What do you think the rest of the question looks like?

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