

Physics Final REVISED as Study Guide

Which of the following is **equal** to 1 centimeter?

- A. 100 meters
- B. 1/10 of a millimeter
- C. 10 millimeters
- D. 100 millimeters

One kilometer equals 1000 meters. What does the prefix **Kilo** mean?

- A. 1
- B. 10
- C. 100
- D. 1000

A person walks 1 mile every day for exercise, leaving her front porch at 9 am and returning to her front porch at 9:25 am. **What is the total displacement of her daily walk?**

- A. 1 mile
- B. 0 miles
- C. 25 minutes
- D. none of the above

What is the most appropriate **SI unit** to express the speed of a cyclist in the last leg of a 10-km race?

- A. km/s
- B. km/h
- C. m/s
- D. cm/h

Why are scientific models important?

- A. They prove scientific theories
- B. They help visualize things that are very complex, very large or very small
- C. They make it harder to understand things.
- D. They never change.

The SI unit of **force** is the

- A. Kilogram
- B. Joule
- C. Meter
- D. Newton

When an **unbalanced force** acts on an object,

- A. the object's motion does not change
- B. the object accelerates
- C. the weight of the object decreases
- D. the inertia of the object increases

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The **forces** acting on a falling leaf are

- A. air resistance and fluid friction
- B. gravity and air resistance
- C. gravity and static friction
- D. weight and rolling friction

Newton's third law of motion describes

- A. action and reaction forces
- B. balanced forces
- C. centripetal forces
- D. net force

An open parachute increases **air resistance** of a falling sky diver by

- A. decreasing the weight of the diver
- B. increasing surface area
- C. increasing the terminal velocity
- D. reducing fluid friction

A force acting on an object **does no work** if

- A. a machine is used to move the object.
- B. the force is not in the direction of the object's motion.
- C. the force is greater than the force of friction.
- D. the object accelerates.

Work is a transfer of

- A. energy
- B. force
- C. mass
- D. motion

The **energy of motion** is called

- A. kinetic energy
- B. potential energy
- C. thermal energy
- D. work

An object's **gravitational potential energy** is directly related to all of the following EXCEPT

- A. its height relative to a reference level
- B. its speed
- C. its mass
- D. the acceleration due to gravity

Which of the following is an example of an object with **elastic potential energy**?

- A. a wind-up toy that has been wound up

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- B. a compressed basketball
- C. a stretched rubber band
- D. all of the above

A 4kg cat is resting on top of a bookshelf that is 2 meters high. What is the cat's **gravitational potential energy** relative to the floor if gravity is 9.8m/s^2 ?

- A. 6 J
- B. 8 J
- C. 20 J
- D. 78 J

Which of the following increases when an **object becomes warmer**?

- A. Chemical energy
- B. Elastic Potential energy
- C. Nuclear energy
- D. Thermal energy

To determine the **speed of a wave**, you would use which of the following formulas?

- A. speed = frequency x amplitude
- B. speed = wavelength x frequency
- C. speed = wavelength x amplitude
- D. speed = wavelength x period

What is the **potential energy** of a 5 kg object located 2 m above the ground?

- A. 2.5 J
- B. 10 J
- C. 98 J
- D. 196 J

A box with a mass of 14.8 kg sits on the floor. **How high would you have to lift the box** for it to have a gravitational potential energy of 355 J?

- A. 1.62 m
- B. 2.40 m
- C. 2.45 m
- D. 4.90 m

If the **amplitude** of a wave changes, which of the following changes?

- A. wave energy
- B. wave speed
- C. frequency
- D. refraction

What is the highest point of a **transverse wave** called?

- A. crest

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- B. compression
- C. wavelength
- D. trough

Using the scientific definition, which of the following is true of **work**?

- A. It is difficult
- B. It involves levers
- C. It involves a transfer of energy
- D. It is done with a machine

When an **energy transformation** occurs, which of the following is true?

- A. mechanical energy doesn't change
- B. mechanical energy is lost
- C. the total energy doesn't change
- D. mass is converted into energy

The **gravitational potential energy** of an object changes when which of the following changes?

- A. the object's speed
- B. the object's mass
- C. the object's temperature
- D. the object's length

What occurs when **energy** is transferred from one object to another?

- A. an explosion
- B. a chemical reaction
- C. nuclear fusion
- D. a change

What is the **gravitational force** exerted on an object called?

- A. centripetal force
- B. friction
- C. momentum
- D. weight

Which of the following is true about an object in **free fall**?

- A. its acceleration depends on its mass
- B. it has no inertia
- C. it pulls on earth, and earth pulls on it
- D. its momentum is constant

Which of the following exerts the strongest **gravitational force** on you?

- A. the moon
- B. the earth
- C. the sun

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D. this test

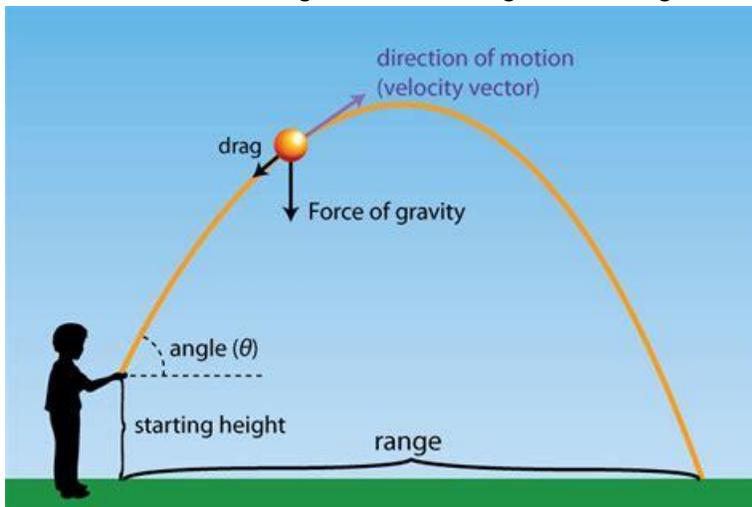
What is the **momentum** of a 100 kg football player running at a speed of 4 m/s?

- A. 400 kg(m/s)
- B. 104 kg(m/s)
- C. 98 kg(m/s)
- D. 25 kg(m/s)
- E. .004 kg(m/s)

How much more **work** is done to push a box 2.5 m with a force of 30 N than to push a box 2.0 m with a force of 26 N?

- A. 28 J
- B. 23 J
- C. 4 J
- D. 56 J
- E. 59 J

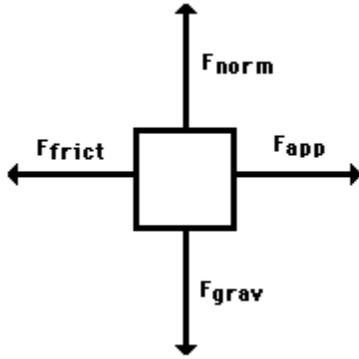
From the attached image: The following is an acting **force** on the ball as **it's in the air**



- A. Starting Height
- B. Range
- C. Drag
- D. Angle
- E. Direction of motion

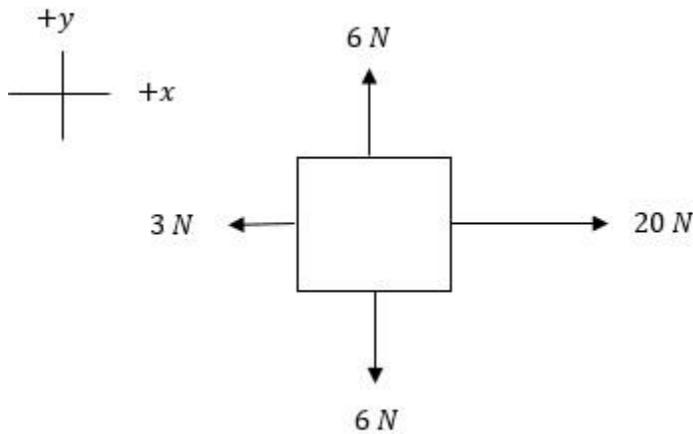
If the object represented by this box isn't accelerating, and gravity is acting on it with a force of 50 N, the applied force (F_{app}) is 25 N, **then the force of gravity should be**

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- A. 25 N
- B. 75 N
- C. 100 N
- D. 50 N
- E. 0 N

According to the image below, the object has an **acceleration** of



- A. 17 N Right
- B. 17 N Left
- C. 0 N
- D. 6 N Up
- E. 6 N Down

What is the **momentum** of a 50 kg ice skater gliding across the ice at a speed of 2 m/s?

- A. 25 kg/m/s
- B. 48 kg(m/s)
- C. 50 kg
- D. 100 kg(m/s)
- E. 150 kg/m/s

Find the **force** a person exerts in pulling a wagon 20 m if 1500 J of work is done.

- A. 1480 N
- B. 0.013 N

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C. 1520 N

D. 75 N

Jerrid and Ethan are running a race (the 100 m dash). Jerrid finishes in 9 seconds, while Ethan finishes in 8.9 seconds. Both runners return to the starting line. What is their **total displacement**?

A. 0 m

B. 50 m

C. 200 m

D. 100 m

Jerrid and Ethan are running a race (the 100 m dash). Jerrid finishes in 9 seconds, while Ethan finishes in 8.9 seconds. Both runners return to the starting line. What is the **average speed** of Jerrid?

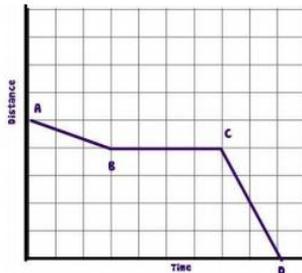
A. 900 m/s

B. 11.1 m/s

C. 91 m/s

D. 109 m/s

For the attached image: compared to the average speed of the graph, the **speed** between points C and D would be considered



A. Greater

B. Lower

C. The same

Equations to keep for later:

$$p = m v$$

$$PE + KE = TE$$

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$$F = m a$$

$$S = d / t$$

$$N = \text{Force}$$

$$J = \text{energy}$$

$$A = \Delta v / \Delta t$$

$$V = \text{speed w/direction}$$

Law of conservation of Force

Law of conservation of Energy

Fill in others as needed!