NAME _____ **PERIOD** ____

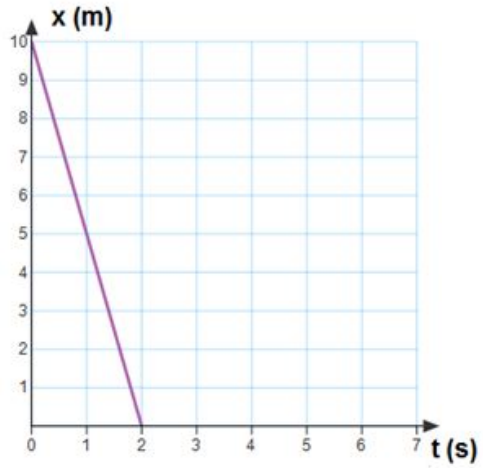
PHYSICS 1: SEMESTER 1 FINAL REVIEW

Multiple Choice Questions

UNIT 2: One Dimensional Kinematics with Constant Velocity

1. Define and explain speed and velocity.
2. A horse gallops a distance of 10 kilometers in a time of 30 minutes. What is it's average speed?

The following graph represents the position as a function of time for a moving object. Use this graph to answer question #3-4.



3. What is the velocity of the object?
4. Write an equation that represents the motion of the object?
5. A car is making a 12-mile trip. It travels the first 6.0 miles at 30 miles per hour and the last 6.0 miles at 60 miles per hour. What is the car's average speed for the entire trip?

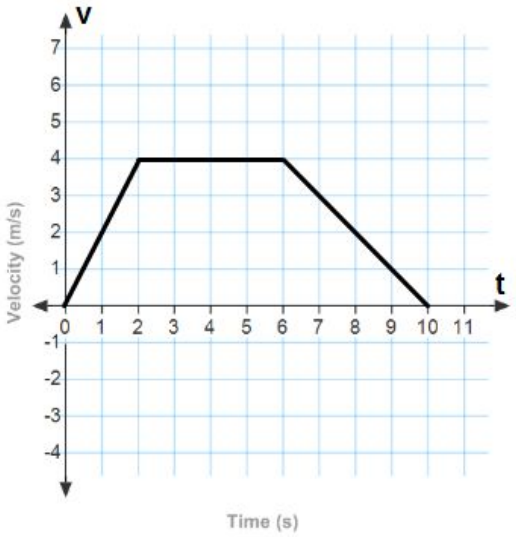
UNIT 3: One Dimensional Kinematics with Constant Acceleration

1. Define and explain acceleration.
2. Identify the difference between positive and negative acceleration.
3. If a rocket is initially at rest and accelerates at a rate of 50 m/s^2 for one minute, then what is its final speed?
4. It takes 6 seconds for a stone to fall to the bottom of a mine shaft. How deep is the shaft?

NAME _____ **PERIOD** ____

PHYSICS 1: SEMESTER 1 FINAL REVIEW

The velocity as a function of time for a moving object is shown by the graph. Use the graph to answer question 3.



5. Use the graph to identify the velocity, acceleration, and displacement of the object.

UNIT 4: Vectors

1. Identify and explain the difference between scalars and vectors.
2. A vector has components $\mathbf{A}_x$ = 12 m and $\mathbf{A}_y$ = 5.0 m. What is the magnitude and direction of vector **A**?
3. A displacement vector of 20 m is directed at 30 degrees above the positive x-axis. Draw the vector and find its components.
4. Vector M = 4.00 m points eastward and vector N = 3.00 m points northward. What is the magnitude and direction of the resultant vector R = M + N?
5. A plane is headed eastward at a speed of 156 m/s. A 20.0 m/s wind is blowing southward at the same time as the plane is flying. What is the velocity of the plane relative to the ground?

NAME _____ PERIOD ____

PHYSICS 1: SEMESTER 1 FINAL REVIEW

UNIT 5: Two Dimensional Kinematics and Projectile Motion

1. A cannonball is fired horizontally from the top of a cliff. At the same instant that the cannon fires, another cannonball is dropped straight down from the same height. Explain which cannonball will land first?
2. A rock is thrown upward at an angle of 50 degrees with respect to the horizontal. If the rock has an initial speed of 15 m/s, find the horizontal and vertical components of its velocity?
3. A hockey puck slides off the edge of a table with an initial velocity of 20.0 m/s. The height of the table above the ground is 2.00 m. How far from the edge of the table, measured along the floor, does the puck hit the floor?
4. A toy car runs off the edge of a table that is 1.225 m high. The car lands 0.400 m from the base of the table. How fast is the car traveling when it strikes the ground?
5. A boy kicks a football from ground level with an initial velocity of 20 m/s at an angle of 60° above the horizontal. What is the horizontal distance to the point where the football hits the ground?

UNIT 6: Newton's Laws of Motion

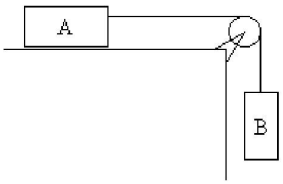
1. Define Newton's three laws of motion and give examples of each.
2. A physics class is split into two teams for a competitive game of tug-of-war. There is a scale to measure force in the middle of the tug-of-war rope. One team pulls with 400 N of force and the other team also pulls with 400 N of force. What is the reading on the scale in the middle of the rope? Explain.
3. A force of 120 N is applied to an object whose mass is 30 kg. What is the object's acceleration.
4. An astronaut weighs 72.7 N on the Moon, where the acceleration of gravity is 1.62 m/s^2. How much does she weigh on Earth?
5. A 40.0-kg crate is being raised by means of a rope. Its upward acceleration is 2.00 m/s^2. What is the force exerted by the rope on the crate?

NAME _____ **PERIOD** ____

PHYSICS 1: SEMESTER 1 FINAL REVIEW

UNIT 7: Dynamics

1. Define and explain normal, friction, tension, and spring forces.
2. A block of mass m = 5.0 kg slides down a frictionless plane inclined at an angle 20 degrees with the horizontal. Find the magnitude of the normal force exerted by the plane on the block.
3. A spring stretches 14 cm when an object weighing 28 N is hung from it. What is the spring constant?
4. In a game of shuffleboard (played on a horizontal surface), a puck is given an initial speed of 6.0 m/s. It slides a distance of 4.6 m before coming rest. What is the coefficient of kinetic friction between the puck and the surface?
5. Block A has a mass of 3.00 kg and rests on a smooth table and is connected to block B, which has a mass of 2.00 kg, after passing over an ideal pulley, as shown. Block B is released from rest. What is the acceleration of the masses?



UNIT 8: Circular Motion and Gravitation

1. Define and explain centripetal acceleration and centripetal force.
2. Define and explain Newton's Law of Universal Gravitation.
3. A 2-kg ball is moving with a constant speed of 5 m/s in a horizontal circle whose radius is 50 cm. What is the magnitude of the net force on the ball?
4. At their closest approach, Venus and Earth are 4.20×10^{10} m apart. The mass of Venus is 4.87×10^{24} kg, the mass of Earth is 5.98×10^{24} kg, and $G = 6.67 \times 10^{-11}$ N□m^2/kg^2. What is the force exerted by Venus on Earth at that point?
5. Jupiter completes one revolution about its own axis every 9.92 hours. What is the radius of the orbit required for a satellite to revolve about Jupiter with the same period? Jupiter has a mass of 1.90×10^{27} kg and $G = 6.67 \times 10^{-11}$ N•m^2/kg^2.