Name:_____

Physics Final Exam Review

Multiple Choice (the test will have 3 of these per unit)

1. An object weighs 30N on earth. A second object weighs 30N on the moon. Which has the greater mass?
    a. The one on Earth
    b. The one on the moon
    c. They have the same mass
    d. Not enough information

2. In the diagram below, a box is on a frictionless horizontal surface with forces F1 and F2 acting as shown. If the magnitude of F1 is greater than the magnitude of F2, then the box is

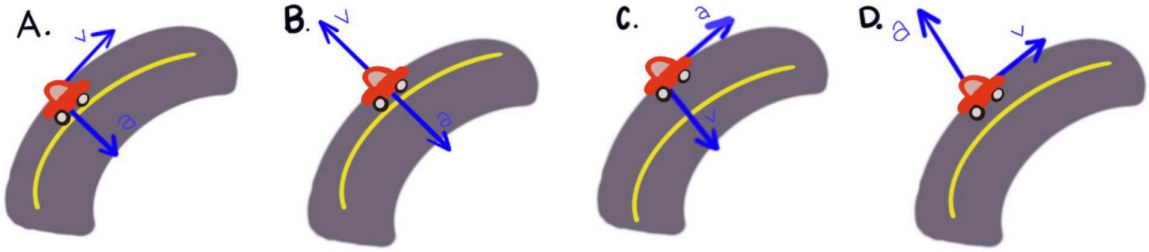
a) moving at constant speed in the direction of F2
b) moving at constant speed in the direction of F1
c) accelerating in the direction of F2
d) accelerating in the direction of F1

3. The force required to maintain an object at a constant speed in outer space is equal to
    a. The mass of the object
    b. The weight of the object
    c. Zero
    d. The force required to stop it
    e. None of the above

4. In each of the following situations, what effect will the change have on the amount of friction? Use the following choices: a) increase b) decrease c)no change

_____) The normal force (force pushing surfaces together) increases
_____) The roughness of only one surface is increased
_____) The surface area in contact increases
_____) A lubricant is added between the surfaces
_____) Static friction changes to kinetic friction

5. Adelle's car rounds a horizontal curve of constant radius at a constant speed. Which diagram best represents the directions of both the car's velocity, v, and acceleration, a?

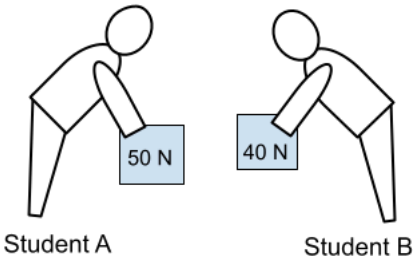


6. Is it possible for an object moving with a constant speed to accelerate? Explain.
   (A) No, if the speed is constant then the acceleration is equal to zero.
   (B) No, an object can accelerate only if there is a net force acting on it.
   (C) Yes, although the speed is constant, the direction of the velocity can be changing.
   (D) Yes, if an object is moving it can experience acceleration

7. A planet is discovered to orbit around a star in the galaxy Rory, with the same orbital diameter as the Earth around our Sun. If that star has 4 times the mass of our Sun, what will the period of revolution of that new planet be, compared to the Earth's orbital period?
   A) one-fourth as much
   B) one-half as much
   C) twice as much
   D) four times as much

8. Under which of these conditions would the kinetic energy of an object increase?
   a. The weight of the object decreases.
   b. The object increases its temperature.
   c. The speed of the object increases.
   d. The momentum of the object decreases.

9. Ashely lifts a 50-newton box from the floor to a height of 0.40 meter in 2.0 seconds. Katelyn Lifts a 40-newton box from the floor to a height of 0.50 meter in 1.0 second. Compared to Ashley, Katelyn does



a) the same work but develops more power
b) less work but develops more power
c) the same work but develops less power
d) more work but develops less power

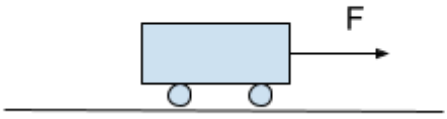
10. Two cars - a 1200-kg car and a 2400-kg car - are lifted to the same height at a constant speed in an auto service station. Lifting the more massive car requires ____ work.

a. less
b. the same
c. twice as much
d. four times as much
e. more than 4 times as much

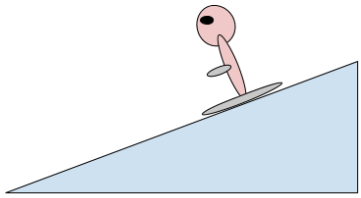
Open Ended (the test will have 3-4 of these per unit)

1. Gavin, having a mass of 75 kg, holds in his hands a bag of flour weighing 40N. With what force does the floor push up on his feet?

2. Noelle applies a horizontal force to pull a 5.0-kilogram cart at a constant speed of 5.0 m/s across the floor, as shown in the diagram below. If the force of friction between the cart and the floor is 10. Newtons, the magnitude of the horizontal force along the handle of the cart is

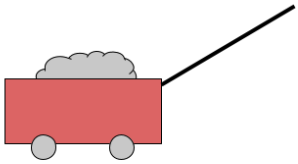


3. A 75 kg Addassah accelerates from rest to a speed of 12 m/s in 3.0 seconds on a frictionless hill. What is the slope of the hill? B) Draw a FBD



4. A 20 kg wagon is pulled along the level ground by a rope by inclined 30 degrees above the horizontal by Brissa

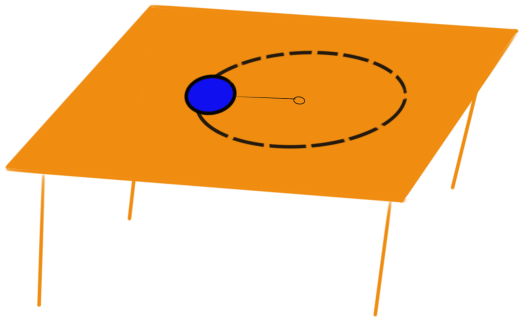
(A) Draw a FBD of the wagon *(friction is negligible)*



(B) How large is the pulling force if the wagon accelerates of .4 m/s^2?

(C) What is the normal force of the wagon?

5. A .013kg rubber ball is attached to a 0.93m string. The ball is swung in a horizontal circle on a frictionless table by Grace, making one revolution in 1.18 seconds.

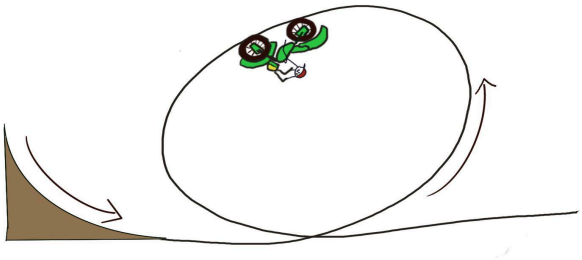


(A) With what speed is the ball traveling?

(B) Find the tension force exerted by the string on the ball

6. Hayla is flying on an airplane 11,887m above ground. Determine the force of gravitational attraction between the earth (5.98×10^{24} kg) and the 70 kg Hayla if the distance of Earth's radius is 6.38×10^{6} m. Also, find the acceleration of gravity Hayla experiences.

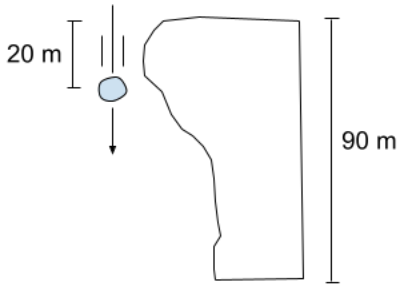
7. Sophia with a mass of 80-kg rides a motorcycle down a ramp and around a vertical loop. If the loop has a radius of 16m, what is the slowest speed Sophia can have at the top of the loop to avoid falling?



8. Mars travels at an average speed of 2.41×10^{4} m/s around the Sun, and takes 5.94×10^{7} s to complete one revolution. How far is the center of Mars from the center of the Sun?

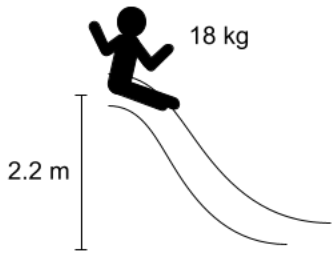
9. An 80-kg Kizzy slides into third base. She experiences 60 N of friction force over a distance of 1.2 m. What is the amount of work friction does on Kizzy?

10. A 1-kilogram rock is dropped from a cliff 90 meters high by Natalie. After falling 20 meters, the kinetic energy of the rock is approximately



11. A 4.0×10^3 watt motor applies a force of 8.0×10^2 Newtons to move a boat Charlize is riding in at constant speed. How far does the boat move in 16 seconds?

12. At a playground, an 18-kg David plays on a slide that drops a height of 2.2m. David starts at rest at the top of the slide. On the way down, the slide does a nonconservative work of -373 J on David. What is David's speed at the bottom of the slide?



13. A 55-kg Treven ascends (climbs) 15 meters up a steep cliff in 45 seconds. How much power does Treven produce?