

## Gravity/Friction/Momentum Review 2

1. State the Law of Conservation of Momentum. "When two or more objects interact ...

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a) Write the mathematical formula \_\_\_\_\_

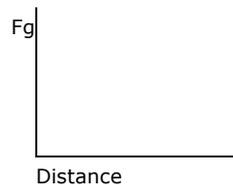
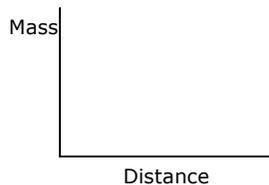
b) If the objects are going in opposite directions, what do you have to remember to do?

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2. When a hunter fires her gun, the total momentum of the gun, bullet and her body = \_\_\_\_\_  
Why?

3. A 200 N block is at rest on a horizontal table. A force of 40 N is required to start the block moving. What is the maximum coefficient of static friction between the box and the surface?

4. Sketch the shape of the plot of a **mass vs. distance** and **Gravitational force vs. distance** for a rocket ship moving away from the earth.



5. Compare the force of friction that you must overcome to start a block moving with the force of friction you need to overcome to keep a block moving at constant speed.

6. Compare the impulse a golf club applies to a golf ball with the impulse the ball applies to the club.

7. Convert the Houston Rockets center Yao Ming's weight (300 pounds) to kilograms \_\_\_\_\_ and newtons \_\_\_\_\_

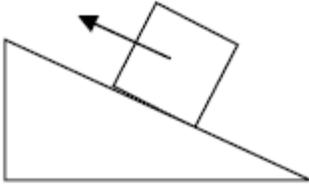
$$\text{kg} = \text{_____ lbs} \quad 1 \text{ kg} = \text{___ N}$$

8. Be able to create the big momentum equation  $J = Ft = \text{_____} = \text{_____}$

9. When do you use  $M_1V_1 = M_2V_2$  ? (Practice these problems)

10. 2 cars are at rest with a coiled spring between them. One car is 100 kg and the other car is 75 kg. When the coiled spring between the carts is released the cars are pushed apart. If the 75 kg cart attains a speed of 4 m/s, what speed does the 100 kg attain?

11. If a box is being pulled up a ramp, what would the direction of the friction be?



12. A 300 kg car skids on a horizontal wet concrete road. What is the force of friction on the car?

13. A 300 N car skids on a horizontal wet concrete road. What is the force of friction on the car?

14. What can you do to a car to increase the amount of friction between the car's tire and the road?

15. A 2 kg object traveling 3 m/s east has a perfectly elastic collision with a 12 kg object traveling 4 m/s west.

a) Find the total momentum **after** the collision

16. A hunter fires a bullet from a rifle. What is the total momentum of the rifle, hunter and bullet after the rifle is fired? If the momentum of the bullet is 1200 kg m/s, what is the momentum of the hunter and rifle?