

After Christmas Review

1. A jogger runs for 10min at 5m/s. How far has she traveled?
2. A Car accelerates from rest at 6m/s^2 . It does this for 30s.
 - a. How far has it gone?
 - b. What is its final speed?
3. A penny falls from the top of the empire state building (240m),
 - a. How fast is it going when it hits the ground?
 - b. How long does it take to fall?
4. A Truck on the highway is traveling at 30m/s when it slows down with an acceleration of 6m/s^2 .
 - a. How long will it take to stop?
 - b. How far does it travel while it is stopping?
5. An 8kg box is pushed with a force of 10N, What is the acceleration of the box?
6. A 15kg cart is being pushed by a boy to the North with a force of 80N. At the same time, a girl is pushing 100N to the South. What is the acceleration of the cart?
7. What is the kinetic energy of a 0.20Kg Baseball traveling at 30m/s?
8. What is the potential energy of a 1000kg Rock at the top of a 10m high hill?
9. A boy pushes a 10kg box with a force of 5.0N for a distance of 12m. What is the work done on the box?
 - a. If it took the boy 10s to do the work in problem 9, what is the power output of the boy?
 - b. What was the acceleration of the box when the boy was pushing it?
 - c. If the box started at rest, what was the final velocity of the box?
10. A 1000kg roller coaster is at the top of a 20m high hill. What is the velocity of the roller coaster when it gets to the bottom of the hill?
11. A roller coaster is traveling at 5.0m/s when it gets to the top of a 12m high hill. It then goes down the hill and back up a second hill of height 4.0m. What is the velocity of the roller coaster when it passes over the second hill?
12. A girl swings a golf club which hits a 0.050kg golf ball. The golf club applies an average of 150N of force for 0.100s.
 - a. What is the impulse applied to the golf ball?
 - b. If the golf ball started at rest, what is the final velocity of the golf ball?
13. How many significant figures:
 - a. 2.000
 - b. 4.04
 - c. 60000
 - d. 0.00007
 - e. 0.00506
 - f. 0.00500
14. Convert the following:
 - a. 2.2 miles into feet (5280ft = 1 mile)
 - b. 3.2ft into centimeters (2.54cm = 1in)
 - c. 28 days into seconds
15. A 4.0kg block of wood is sliding to the right at 12m/s. It colides with a 2.0kg block of clay that was at rest. They stick together and continue to move at what velocity?

After Christmas Review

16. A 2.0kg red ball is traveling to the right at 4.0m/s, at the same time, a 3.0kg green ball is traveling to the right at 6.0m/s. The green ball catches up to the red ball and crashes into it. After the collision, the red ball is traveling at 9.0m/s to the right. How fast is the green ball traveling after the collision?
17. A ball falls from a 12m roof on a strange new planet. It takes 6.70 seconds to fall to the ground.
 - a. What is the acceleration on this new planet?
 - b. What is the average speed of the ball during the fall?
18. A 3.4kg rock is above the ground and has 25Joules of potential energy. How high above the ground is the rock?
19. Define Inertia. What Newton's Law explains inertia in detail.
20. When a cannon is fired, the ball travels in one direction, but the cannon itself moves back in the opposite direction for a few feet. What newton's law describes why the two objects (the ball and the cannon) react in such a way.