Energy Review 2

13. Peter, Paul and Mary are lifting weights. Peter lifts 135 kg 0.8 m in 1 second. Paul lifts 150 kg 1.3 m in 1.4 seconds. Mary lifts 124 kg 0.9 m in 1.3 seconds.

a. Who does the most work?

b.　　　Who is most powerful?

14. A 25 g bullet with a horizontal velocity of 500 m/s, comes to a stop 12 cm within a solid wall.

a. What is the initial KE of the bullet?

b.　　　What is the final KE of the bullet?

c.　　　What was the average force on the bullet?

15. An apple falls 3.5 m from the branch of a tree to the ground below.

a. How fast is the apple moving when it hits the ground? Use conservation of energy.

b.　　　At what point is KE = PE?

c.　　　How fast is the apple moving when it is 1 m off the ground?

16. A roller coaster cat with a mass of 200 kg is at rest at point A. What is speed of the cart at point B and point C?

17. A force of 200 N is applied to a 50 kg crate to slide it across the floor a distance of 70 m.
a. How much work is required to slide the crate along the floor?

b.   How much work would be required to lift the crate to a height of 70 m?

18. A force of 20 N is required to push a 5 kg object up a 13 m incline.
a. How much work is done by the applied force?

b.   How much work would be needed to lift the 5kg object straight up to a height of 4 m?

c.   Why does it take more work to use the incline?

Answers:
13. a) Peter = 1080 J, Paul = 1950 J, Mary = 1116 J   b) Peter = 1080 W, Paul = 1393 W, Mary = 858 W
14. a) 3125 J   b) 0 J   c) 26,000 N   HINT: 25 g = 0.025 kg & 12 cm = 0.12 m
15. a) 8.4 m / s   b) 1/2 way down   c) 7.1 m / s   16) B = 14.1 m / s & C = 24.5 m / s
17. a) 14,000 J   b) 35,000 J   HINT: how much force does it take to lift up?
18. a) 260 J   b) 200 J   c) because there is (probably) friction on the hill