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## Review up to Simple Machines

1) A box is being slid across a surface where the coefficient of friction (*u*) is 0.35. The force of friction is 343 N. What is the mass of the box?

2) A mass of 400 g is hung from a spring that has a constant of 90 N/m. What is the elongation of the spring? In other words, how far does the spring stretch? Give your answer in centimeters (cm).

3) A planet has a mass of  $8 \times 10^{23}$  kg. The radius of the planet is  $3 \times 10^6$  m. What is the force of attraction (also known as weight) for a 70 kg person who is standing on the surface of the planet?

What is the acceleration due to gravity on this planet?

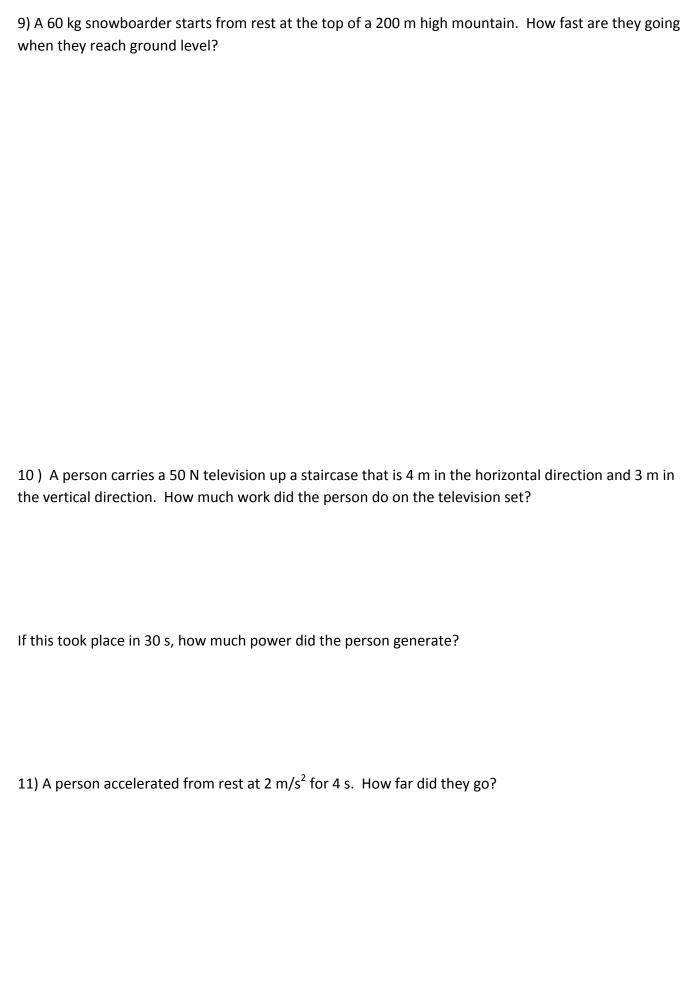
Answers: 1) 100 kg 2) 4.36 cm 3) 415 N 5.93 m/s<sup>2</sup>

4) A net force of 60 N acts on an object for 10 s. The initial speed of the object was 3 m/s. After the 10 s, the speed of the object was 15 m/s. What was the mass of the object?
5) A boulder with a mass of 4000 kg is moving at 30 m/s when it hits a 1000 kg automobile moving at 20 m/s. After the collision, the boulder slows down to 10 m/s. What is the new speed of the automobile?
6) A projectile is fired from the ground at an angle. It reaches a maximum height of 130 m. The horizontal component of its velocity is 200 m/s. What is the range of the projectile?

Answers: 4) 50 kg 5) 100 m/s 6) 2080 m



Answers: 7) 229 N 1.25 m 857.5 J 1145 J 74.9 % 8) 360,000 m



Answers: 9) 62.6 m/s  $\,$  10) 150 J  $\,$  5 W  $\,$  11) 16 m  $\,$