

**STE****Exam Review 4**

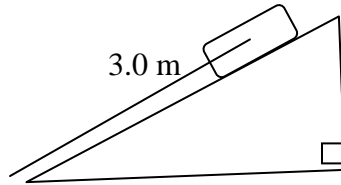
<b>Formulae:</b> $g = 9.8 \text{ N/kg};$ $F = mg;$ $W = \Delta E;$ $W = F \cdot d$ $E_p = mgh$
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1. In the following table,  $g_p/g_e$ , the ratio of a planet's gravitational acceleration to that of the earth, has been calculated for 3 planets and the earth's moon.

planet	relative mass(earth =1)	relative size	$g_p/g_e$
Mercury	0.0553	0.383	0.377
Venus	0.815	0.95	0.903
Earth	1	1	1
Earth's moon	0.0123	0.27	0.169

- a) If a 30 kg piece of metal has that mass on earth, what will its mass be on the moon?  
b) Why?  
c) If the weight of an object is 400 N on Mercury, what will its weight be on the moon?
2. a) Find the net force acting on a box if it's being pulled on by a boy with a 39 N force and in the opposite direction by a girl exerting 45 N. Draw a diagram.  
b) How much work is being done by the boy and girl if the girl ends up dragging the boy for 2.0 m?
3. A 20 kg wagon is pulled at an angle of  $40^\circ$  with a 30 N force.  
a) Show mathematically that there is not enough force to lift the wagon.  
b) Find the acceleration of the wagon.

4. a) How much work is done to push a 22 kg mass up a  $30^\circ$  inclined plane for a slanted distance of 3.0 m?



- b) Use the change in potential energy to arrive at the same answer.
5. a) Calculate the gravitational potential energy of a 30.0 kg mass placed 100.0 m above the surface of Mars where  $g = 3.7 \text{ N/kg}$ .
- b) Find the velocity of the object if it was dropped from that height.
- c) Find the velocity of the object if it was dropped from that height on Earth.