

STE**Pretest 2.3**

Formulae: $g = 9.8 \text{ N/kg};$ $F = mg;$ $W = \Delta E;$ $W = F \cdot d$ $E_p = mgh$
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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 8 planets and the earth's moon. Earth's gravitational acceleration is 9.8 m/s^2 .

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
Mars	0.107	0.532	0.378
Jupiter	317.83	11.9	2.24
Saturn	95.159	9.4	1.08
Uranus	15.536	4.04	0.952
Neptune	17.147	3.88	1.14
Earth's moon	0.0123	0.27	0.169

Consider an 8.0 kg bowling ball.

- a) Calculate the ratio of the ball's mass on Venus to its mass on Neptune.
(2 marks)
- b) Find the weight of the ball on Uranus. (2 marks)

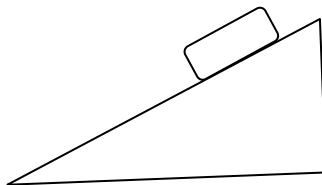
2. Find the net force acting on a box if it's being pulled on by a boy with a 39 N force and in the opposite direction by a girl exerting 45 N. Draw a diagram. (2 marks)

3. A 20 kg wagon is pulled at an angle of 40° with a 30 N force.

a) Show mathematically that there is not enough force to lift the wagon. (2 marks)

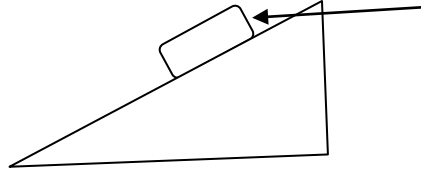
b) Find the acceleration of the wagon. (3 marks)

4. a) How much work is done to push a 22 kg mass up a 27° inclined plane for a distance of 3.0 m?

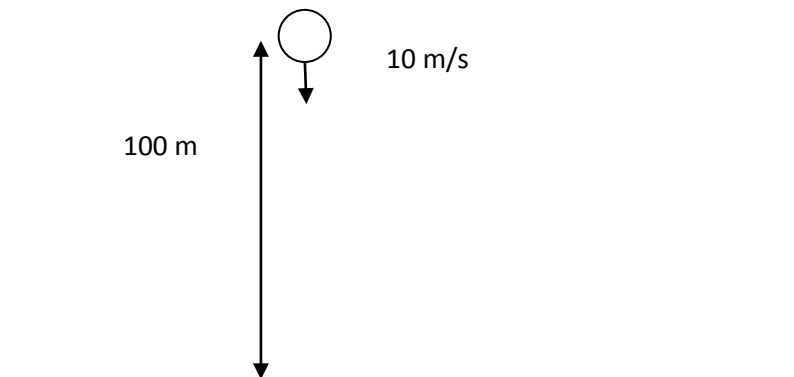


(3 marks)

b) If an additional pushing force of 40 N was applied as shown, how fast would the mass accelerate? Mass is still 22 kg; angle of 27°



5. Calculate the gravitational potential energy of a 30.0 kg mass placed 100.0 m above the surface of Mars where $g = 3.7 \text{ N/kg}$. (3 marks)
6. A 1.00 kg ball at a height of 100.0 m is whipped downward with an initial velocity of 3.0 m/s. Calculate the initial kinetic energy of the ball. (2 marks)
7. A second ball of unknown mass at a height of 100.0 m is whipped downward with an initial velocity of 10.0 m/s. Calculate the speed of the ball as it hits the ground. Do **not** use a mass of 2.00 kg. Simply represent its mass as *m*. (4 marks)



8. You drop two equally-sized balls out of a window. The first ball is made of solid metal. The second one is similar but a bit hollow inside. Which ball will hit the ground first? Why? (2 marks)

Flashback:

1. What is the least electronegative halogen?
2. If the toxic dose of drug X is 0.40 mg/kg, and a patient swallowed 37.5 mg, just enough to get sick, what is the mass of the patient? Physics-speaking, what is the weight of the patient? Respect sig figs
3. Why doesn't sodium form a covalent bond with oxygen?
4. If a 3.0 mole/L solution was diluted to 1.0 mole/L, how much water was added if ended up with a final volume of 300.0 ml?
5. Can you scramble the letters to get a common chemistry word?
 - a) try me sich
 - b) no ici
 - c) l modus