Name: _____ Phys 12

Forces and Dynamics Review Assignment

Show all your work for each question, making sure you draw a free-body diagram. Hand in at the end of class.

1) A person pushes a 5.0kg block across the floor using 7.98N. Find:
   a) The acceleration of the block (2 marks)
   b) The normal force acting on the block (2 marks)
   c) The acceleration of the block if the coefficient of the kinetic friction is $u_k = 0.12$ (3 marks)

a) $1.6\ m/s^2$

b) $49\ N$

c) $0.42\ m/s^2$

2) You are trying to lift a sack of potatoes off the ground. You exert 39N upwards in attempt to lift the sack of potatoes. If the sack of potatoes has a mass of 4.9kg, what is the normal force acting on the sack of potatoes? (3 marks)

$9.0\ N$

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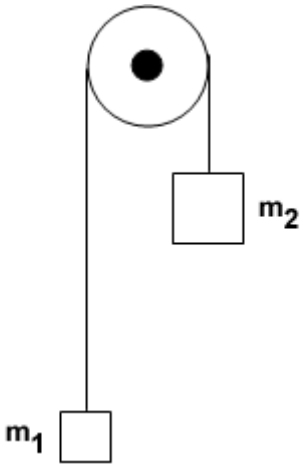
3) Below is a diagram of an Atwood's Machine where m_2 and m_1 are tied by a massless rope hanging from a frictionless pulley. If m_2 = 4.2kg and m_1 = 2.5kg, calculate the acceleration of m_1. (4 marks)



$9.5 m/s^2$ down on the right.

4) Jamie (78kg) is riding on an elevator while standing on a scale. Calculate the reading on the scale given each situation: (8 marks)
   a) When the elevator isn't moving
   b) When the elevator is moving upwards at constant velocity
   c) When the elevator is accelerating upwards at 1.2m/s
   d) When the elevator is accelerating downwards at 0.85m/s
   e) When the cable of the elevator breaks and James + elevator are in free fall (oh no!)

Make sure to show all your work.

a) 78kg or 760N

b) 78kg or 760N

c) 88kg or 860N

d) 71kg or 7.0×10^2 N

e) 0kg or 0N.