Name

Date

Forces at Work (Test Review #1)

1) A family is hanging Christmas decorations outside of the house. The mom hangs a giant snowflake (8 kg) that is suspended (or hanging) from the garage port (or garage frame).

a) If the forces are balanced, what vocabulary word applies?

b) Draw a free-body/force diagram of the forces present.

c) What formula do we use to calculate the force of gravity acting on and object that has mass?

d) What is the vocabulary word that explains/calculates how gravity affects mass?

e) Which of Newton’s laws applies to this hanging snowflake?

f) Is friction present? If so, which one?

g) Calculate the force of gravity acting on the snowflake

Draw units formula algebra solve

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| (you already did this above) |  |  |  |  |

h) Calculate the force of tension (this is very, very similar to normal force, but the object is hanging in this example)

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| (you already did this above) |  |  |  |  |

A day later, the wind outside is really strong. The snowflake is now in the process of falling to the ground.

i) Draw a free-body/force diagram showing the new forces acting on the snowflake.

2) A child has loaded up his toy wagon with stuffed animals, books, and miscellaneous toys. The wagon now has a mass of 13 kg. He pulls with a force of 32 N at an angle of 20 degrees above the x-axis (or horizontal). The coefficient of kinetic friction between the wheels of the wagon and the sidewalk surface is .29.



a) Draw a free-body/force diagram of all of the forces at work (draw two boxes- one representing the bear and the other for the wagon and include the angle of pull)

b) Is friction present? If so, which one?

c) Which of Newton’s laws does this little boy pulling a wagon apply to?

d) Calculate the force of gravity on the wagon (use the weight formula)

e) Calculate the applied force on both axes (below)

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| --- | --- | --- |
| Variables:  FA-  0 (theta)- | Calculate the applied force on the x-axis | Calculate the applied force on the y-axis |

f) Calculate the normal force (add up all of the forces in the y-direction…don’t forget FA)

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| --- | --- |
| Variables:  Fy = 0  FAY = (use answer from prior question)  …there are two more forces present- you find them  =  = |  |

g) Calculate the frictional force between the wagon and the sidewalk (use your new formula for Ff)

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| Units | Formula | Algebra | Solve |

h) Calculate the acceleration of the wagon

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| Units | Formula | Algebra | Solve |

h) Is this wagon in equilibrium?

i) Identify the action-reaction pair in this situation