Topic 2.2 – Forces **Formative Assessment**

NAME: _____ TEAM:__

THIS IS A PRACTICE ASSESSMENT. Show formulas, substitutions, answers (in spaces provided) and units!

1. What is the weight (in Newtons) of a 75-kg person? Draw a free body diagram of that person standing on the ground. Be sure to include labels on all of the forces you have included. 1. _____ ____See diagram____

A wooden crate is being dragged along a floor to the right with a tension of 80. N being applied at an angle of 20° above the horizontal. There is friction between the crate and the floor.

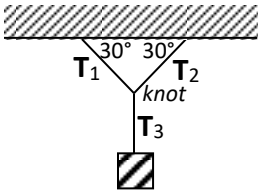
2. Draw a labeled free body diagram of the crate. 2. ____See diagram____

3. If the crate is not accelerating, what is the value of the friction force? 3. _____

4. List the contact force(s) we have discussed. List the action-at-a-distance force(s) we have discussed.

_____

A 95-kg mass is supported by three cables as shown. The two cables anchored to the ceiling make an angle of 30° with the ceiling. The three tensions are labeled.



5. Find the numeric value of T_3. 5. _____

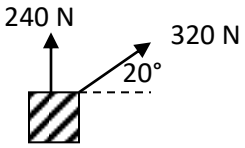
6. Find the numeric values of T_1 and T_2. 6. _____

7. A 25-kg crate being pulled leftward by a force of 45 N, has a dynamic friction force of 32 N. Make a labeled free-body diagram of the crate which includes all forces acting on it. Then find the acceleration of the crate. 7. ____See diagram____ _____

8. What is the acceleration of a 540-newton person who is experiencing a net force of 135 N? 8. _____

There are exactly two forces acting on the 35-kg crate, as shown.

9. What is the resultant force acting on it? 9. _____



10. What is the acceleration of the crate? 10. _____

A 25-N crate is given an initial velocity of 8.0 ms^{-1} on a floor. It slides 12 m.

11. Find the constant acceleration of the crate. 11. _____

12. Find the friction force that stops the crate. 12. _____

13. Find the coefficient of dynamic friction between the crate and the floor. 13. _____

14. Explain the concept of antilock brakes, and why they stop a car in a shorter distance than brakes that completely lock the wheels so that the car skids (the rubber of the wheels slides on the pavement, rather than rolls).

_____

Consider the two crates resting on the floor.

15. Draw a labeled free-body diagram for each of the crates.

15. ____See diagram____

16. Consider all of the forces you labeled. Which pairs, if any, are action-reaction pairs? 16._____

A 750-kg car accelerates from rest to a speed of 28 ms^{-1} in 7.0 seconds. Its acceleration is constant and its drive wheels never "slip" on the road.

17. Draw and label a free-body diagram of the car. 17. _See diagram_

18. Calculate the acceleration of the car. 18. _____

19. Find the coefficient of friction between the car and the pavement. 19. _____

20. Determine which type of friction is giving the car its traction during its acceleration.

20. _____