

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. ●

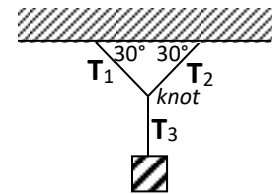
1. _____
 See diagram

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. _____

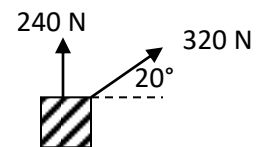
7. A 25-kg crate being pulled leftward by a force of 45 N, has a dynamic friction force of 32 N. Make a labeled free-body diagram of the crate which includes all forces acting on it. Then find the acceleration of the crate. ●

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. _____