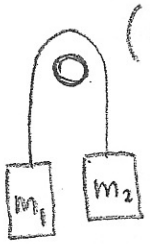
1. Use the pulley shown to answer the following questions.

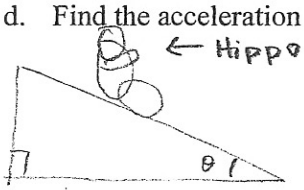
a. Draw the Free Body Diagrams(FBD) for both masses.
b. Which object will accelerate downward?
c. What soul d happen to the acceleration if $m_1 = 20$ kg and $m_2 = 18$ kg?
d. What if both masses were 20 kg? What would the acceleration be? What would the motion of the masses look like in this case? What could you say about the sum of the forces in this case?

(massless, frictionless pulley)



2. A hippo slides down the shown incline. The coefficient of friction between the hippo and the surface is 0.38. The hippo has a mass of 1100 kg.

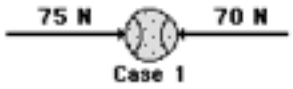
a. Draw a FBD
b. Find the normal force on the hippo(tilted y – axis)
c. Find the Force of friction on the hippo
d. Find the acceleration of the hippo down the incline. (Sum the forces in the tilted x – axis and set equal to ma)



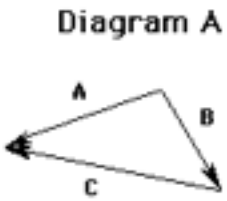
Physics Classroom: Forces

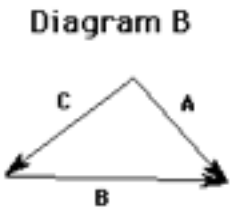
Use the website http://www.physicsclassroom.com to explore Physics Classroom Tutorial on Forces in Two Dimensions. The tutorial will help you review and answer these questions.

1. On two different occasions during a high school soccer game, the ball was kicked simultaneously by players on opposing teams. In which case (Case 1 or Case 2) does the ball undergo the greatest acceleration? Explain your answer.

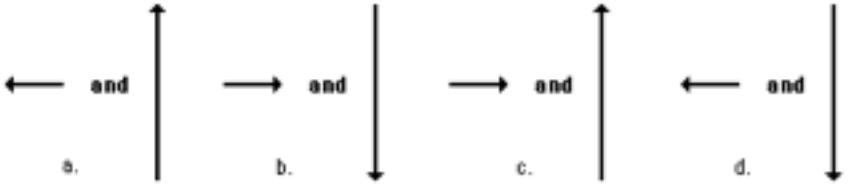


2. Barb Dwyer recently submitted her vector addition homework assignment. As seen below, Barb added two vectors and drew the resultant. However, Barb Dwyer failed to label the resultant on the diagram. For each case, that is the resultant (A, B, or C)? Explain.

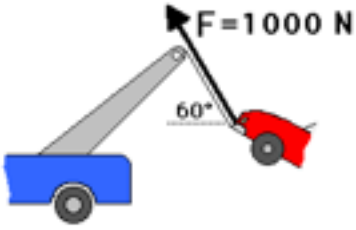




3. The diagram of the truck below depicts a force that makes an angle to the horizontal. This force will have horizontal and vertical components. Which one of the choices below best depicts the direction of the horizontal and vertical components of this force?



4. Consider the tow truck at the right. If the tensional force in the cable is 1000 N and if the cable makes a 60-degree angle with the horizontal, then what is the vertical component of force that lifts the car off the ground?



5. Use your understanding of force relationships and vector components to fill in the blanks in the following diagram and to determine the net force and acceleration of the object. ($F_{net} = m \bullet a$; $F_{frict} = \mu \bullet F_{norm}$; $F_{grav} = m \bullet g$)