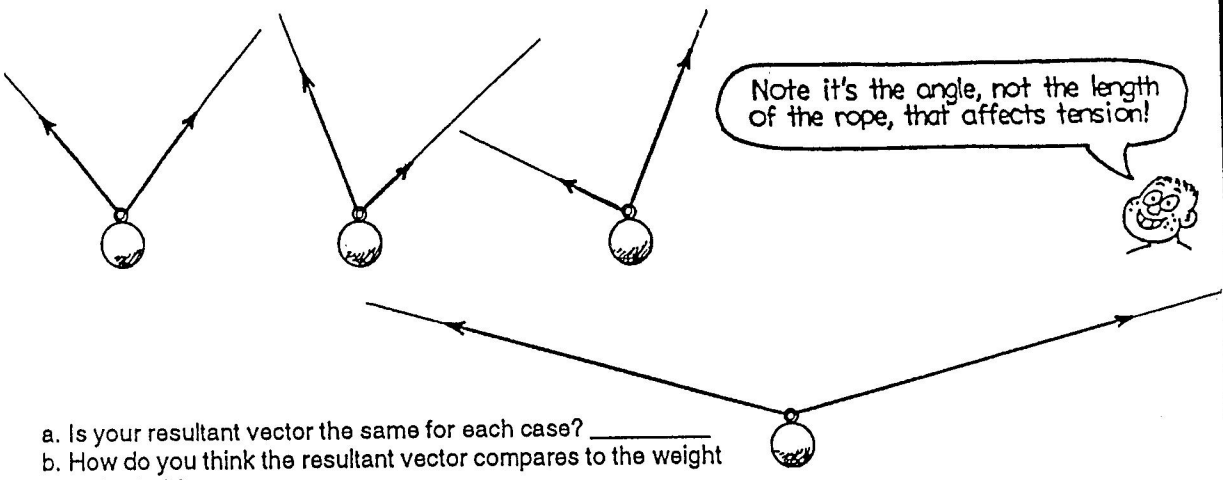
Name _____ Date _____

CONCEPTUAL **Physical Science** PRACTICE SHEET

Chapter 2: Newton's Laws of Motion

Force Vectors and the Parallelogram Rule

1. The heavy ball is supported in each case by two strands of rope. The tension in each strand is shown by the vectors. Use the parallelogram rule to find the resultant of each vector pair.

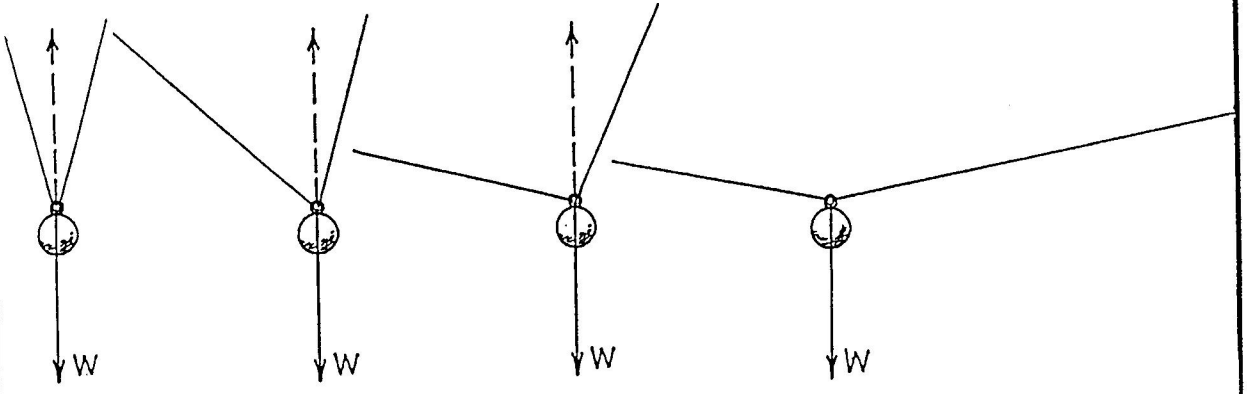


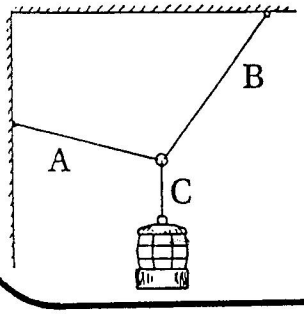
a. Is your resultant vector the same for each case? _____

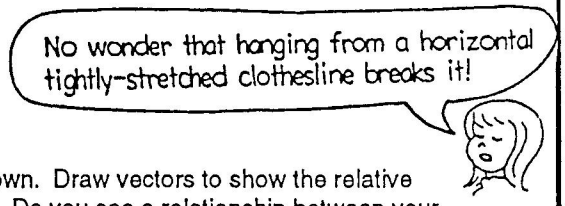
b. How do you think the resultant vector compares to the weight of the ball?

_____

2. Now let's do the opposite of what we've done above. More often, we know the weight of the suspended object, but we don't know the rope tensions. In each case below, the weight of the ball is shown by the vector W. Each dashed vector represents the resultant of the pair of rope tensions. Note that each is equal and opposite to vectors W (they must be; otherwise the ball wouldn't be at rest).
   a. Construct parallelograms where the ropes define adjacent sides and the dashed vectors are the diagonals.
   b. How do the relative lengths of the sides of each parallelogram compare to rope tensions?
   c. Draw rope-tension vectors, clearly showing their relative magnitudes.







3. A lantern is suspended as shown. Draw vectors to show the relative tensions in ropes A, B, and C. Do you see a relationship between your vectors A + B and vector C? Between vectors A + C and vector B?

Hewitt Drawit!