

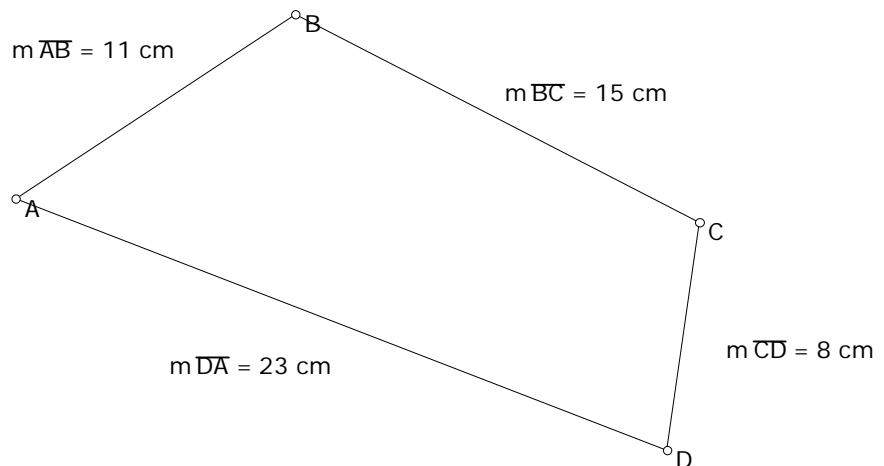
# APPC

## Quiz April 16, 2001

Answer all of the problems on your own paper and document your path to solution. Include nouns and verbs, and -ly words.

1. What did the Mechanical Universe video on the Conservation of Momentum have to share with you about Elastic Collisions? Impulse?
2. Explain how they “turn off” gravity in a grand jete`.
3. Identify the position of the Center of Gravity for this system of particles on the moon.

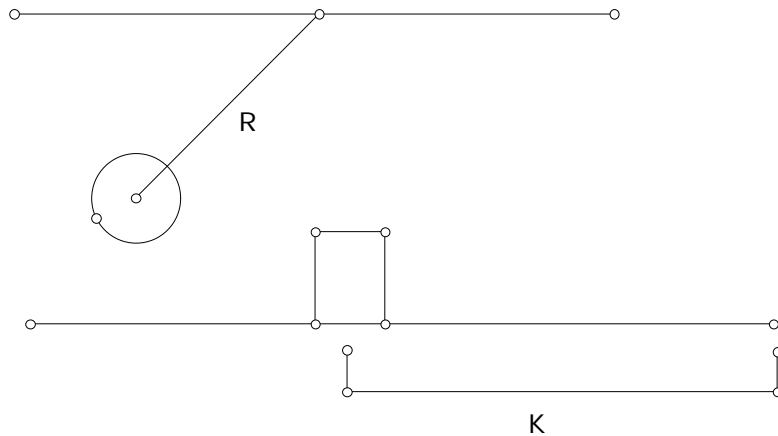
A=2 grams  
B=4 grams  
C=4 grams  
D=2 grams



4. Show how you can mathematically solve two of the following from the APPC 1998 MG worksheet. Pick from Questions 8, 10, 27, 29, 34, and 35.
5. Give one example of an elastic collision with some analytical support of your assumption.
6. A ball is dropped from a height of 7 meters above a floor and rebounds to 75% of that height. Find the coefficient of restitution between the ball and the floor.
7. Identify a Supplementary Problem from the Impulse and Momentum worksheet that was similar to the problem that you presented to the class. State the problem numbers in your answer and Compare and Contrast the two problems.
8. Find the average force exerted by the floor on a super-racquet ball when dropped from a height of 97 cm and returning to a height of 111 cm. Assume the ball has a mass of 51 grams, and the floor interacts with the ball for 0.009 seconds.

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9. A pendulum consisting of a mass of 25 kilograms is released from an angle of  $202^\circ$  with respect to the support of the pendulum as shown below. The mass hits a block of mass 107 kilograms and moves it a distance of  $K$  meters before stopping under the action of a steady frictional force of  $0.21(107)g$ . Find the value of  $K$  if the mass on the pendulum rebounds to an angle of  $222^\circ$ .



10. Share two essential formulas from the lab that your team did (The Spring Thing, Swinging Ellipses, or Up and Down). Explain how they were used in the investigation.
11. A 7-gram fly flies up 7 flights of stairs, a distance of 77 feet in 7.7 seconds. What is the average power required of the fly?
12. A 1666-kilogram car traveling with a speed of 37 miles per hour strikes an obstruction and is brought to rest in 0.07 seconds. What is the average force on the car?