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# Practical Data Gathering

Jack Cairns

# Strategies for Success

- Choose at least 1 senior with a good background in Problem Solving, Statistics, and Physics
- Choose as second student with a solid background in general mathematics and geometry

# Strategies for Success

- Work from strength, write down everything you know about the problem and/or everything that is given to you in the problem
- practice, Practice, PRACTICE,

# Formulae

- Students need facility with all linear, area, & volume formulae for all common geometric shapes such as a line, square, rectangle, triangle, parallelogram, polygon, circle, and the volume analogs such as cube, parallelepiped, sphere, cone, trapezoidal solid, etc.

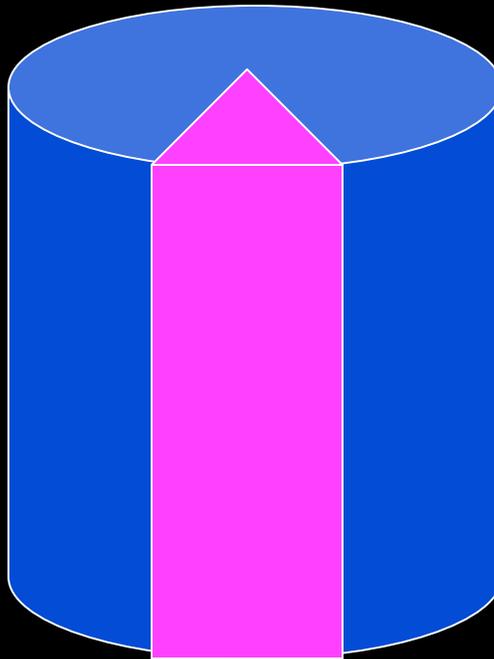
# Formulae

- Although students need not memorize all formulae and concepts from plane and solid geometry and trigonometry (they will be given these), they need facility with the use of the common trig identities.

# Sample Problems

1. Given a liter jar of marbles, one sample marble, and a caliper; determine the volume of water that can be added to the jar to just fill it.
2. Given an irregularly-shaped piece of plastic, a balance and a liter graduate; determine the length of a side of a cube of the same material.

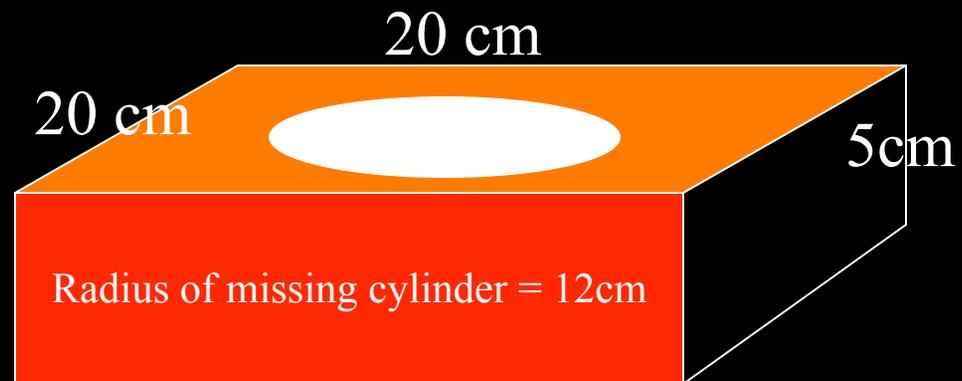
# Sample Problems



3. Given a protractor, a metric ruler and a balance, determine the mass of the missing wedge.

# Sample Problems

Missing cylinder



4. Given the solid above, a metric ruler and a balance, determine the mass of the missing cylinder.

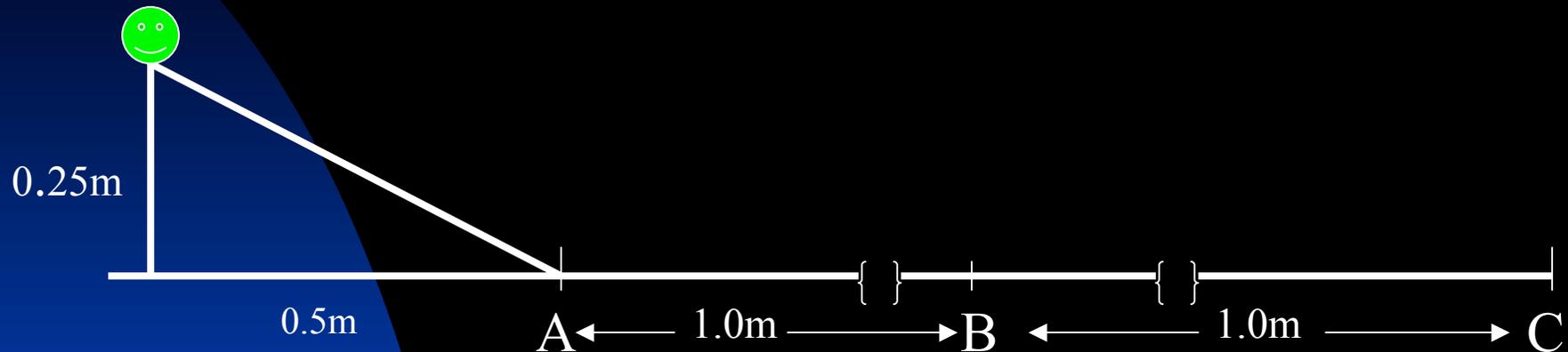
# Sample Problems

5. Given a large bag of M&Ms, fill a film canister with a sample representing the same proportion of colors as are in the larger bag.
6. Determine the heat of fusion of ice in BTUs/pound using the supplied material.

# Sample Problems

7. Determine the density of the gas in the balloon at room temperature, given a balance and metric tape.
8. Determine the volume of the pentagonal solid defined by the central portion of a 5 pointed star.

# Sample Problems



9. The diagram above represents a real situation where a ball is rolled down an inclined plane with the dimensions given. Determine the acceleration of the ball between points B and C, given two 0.1 sec stop watches

# Sample Problems

10. Determine the height of the telephone pole across the parking lot, given a metric tape, a protractor and a meter stick.