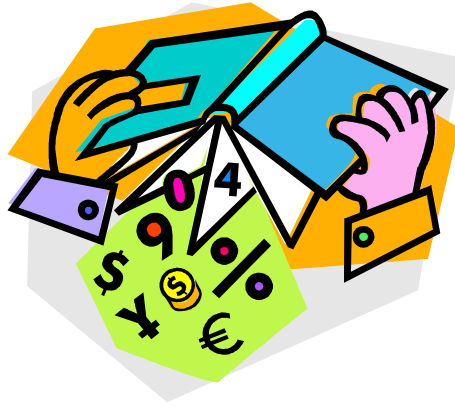


Middle Grades Methods



Dr. Stephan

MAED 5232

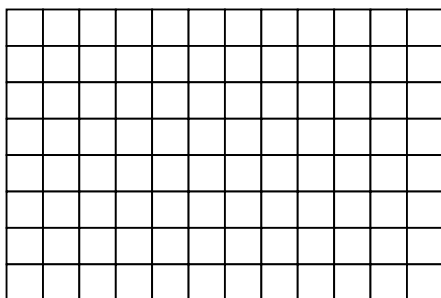
SURFACE AREA

The “Cube – ilicious” Candy Company:



You work for the Cube-ilicious Candy Company, a candy company that packages all their candy in the shape of a cube. Cube-ilicious is ready to introduce a new Caramel Cube, and your department is in charge of wrapping the individual pieces of the candy. After much searching you find a company called “Square Paper Company” that supplies wrapping paper that is made up from individual unit squares of sizes that range from centimeters to inches.

WRAPPING PAPER \$1.08

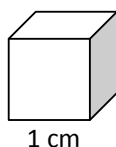


The Square Paper Company charges you \$1.08 for one sheet of their “square” wrapping paper!

A SQUARE DEAL!!!

The Square Paper Company decided to cut a deal to big corporate companies. They will allow companies to purchase just the individual “squares” on the paper, but you must provide them your own wrapping paper design showing individual squares. The cost if you send them a pattern is only \$0.01 per square.

Using the centimeter grid paper provided, draw the wrapping paper design for one single piece of Caramel Candy. You may cut it out with scissors to test that your design actually worked.

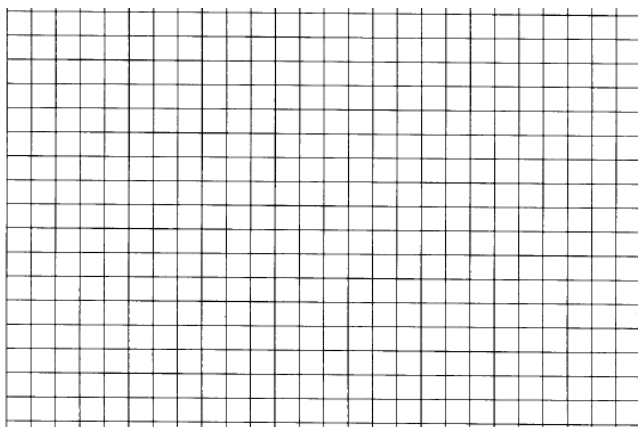
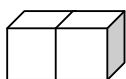


How much does your wrapper cost?

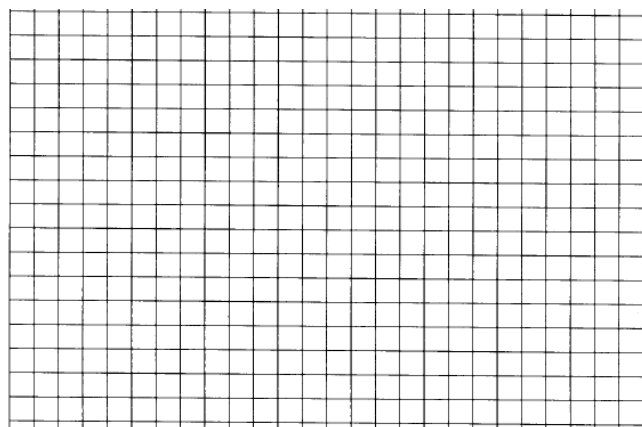
Pretty Packages

How much would it cost to make wrapping paper for the following number of candies? Draw your wrapping paper design on the grid to the right. Your teacher will give you some cubes if you need to build the shape.

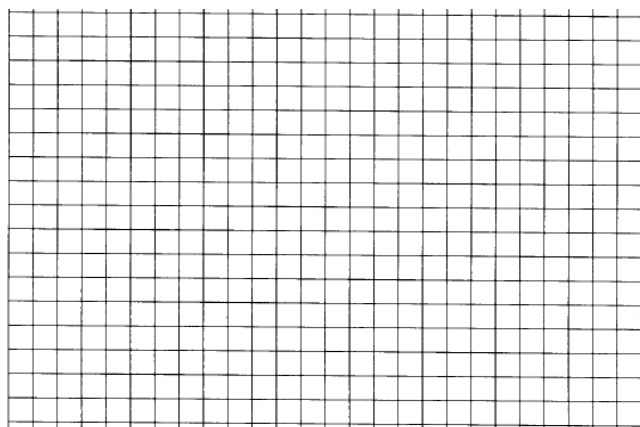
A. Two caramel candies



B. Three caramel candies



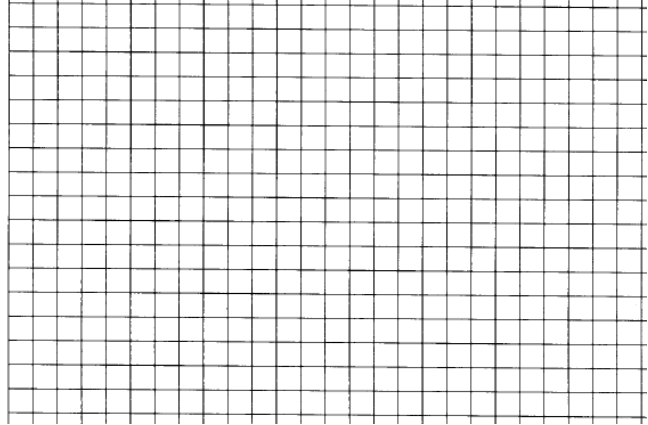
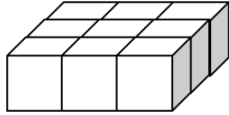
C. Four caramel candies



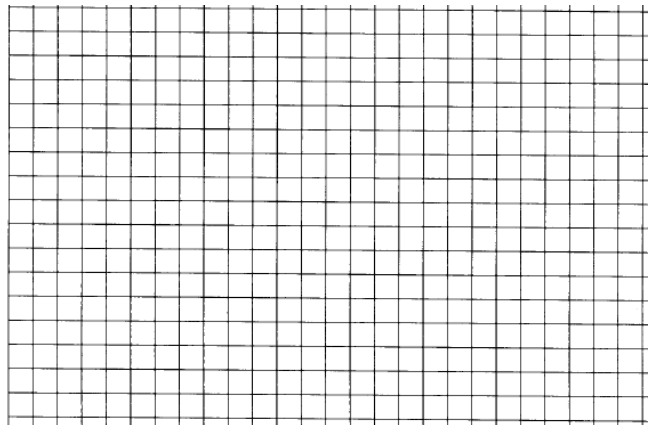
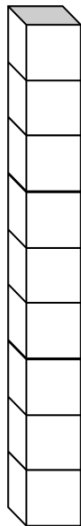
Drawing Wrappers

Draw the TOP, BOTTOM, RIGHT, LEFT, FRONT, and BACK wrappers for each of the following packages of candies. Label each part on your grid.

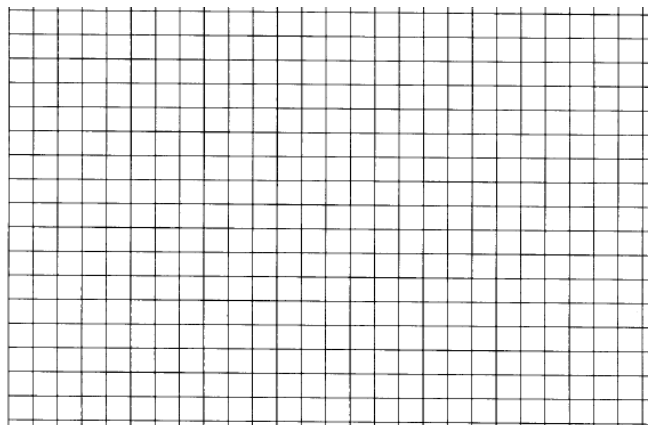
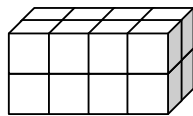
1.



2.

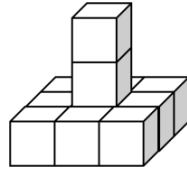


3.



Website Wrappers

What would the **front** of this shape look like?



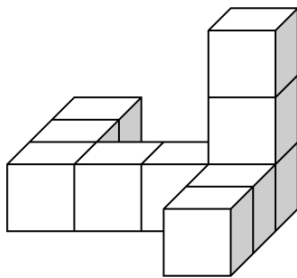
What about the **top**?

Let's go to a web site where we can explore and prove what the different parts of the wrapper would look like!

<http://www.fi.uu.nl/wisweb/en/>

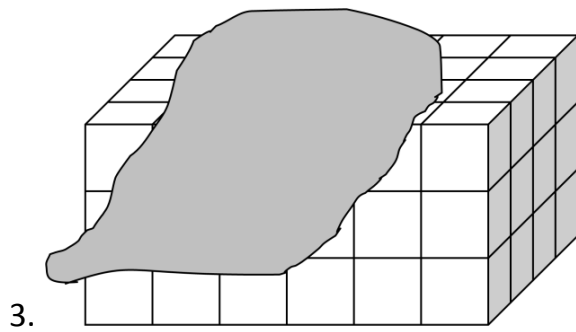
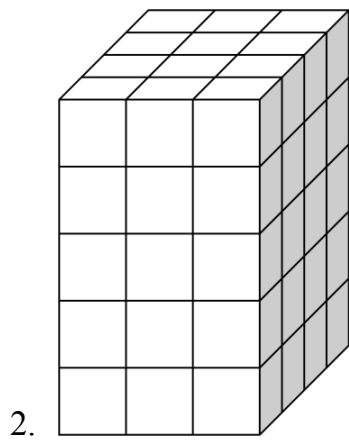
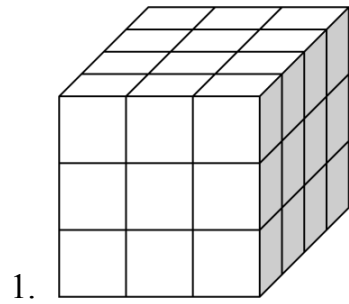
Later in class

Draw all the different views of the following shape:



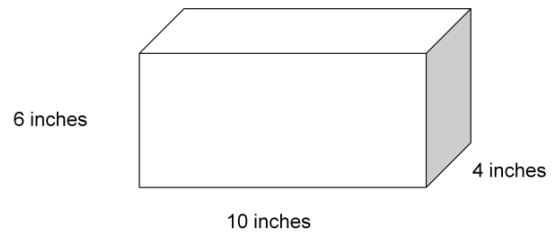
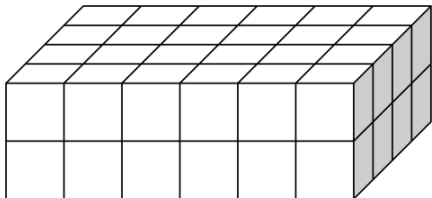
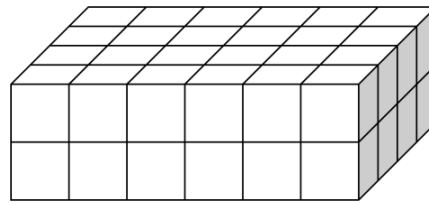
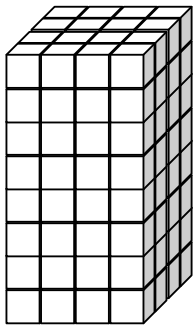
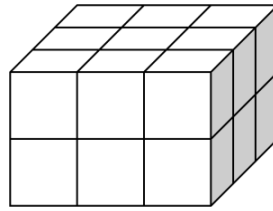
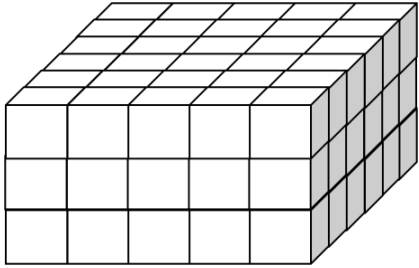
Wrapping Party

How many Square units would it take to wrap the surface of these candy packages? Give proof!



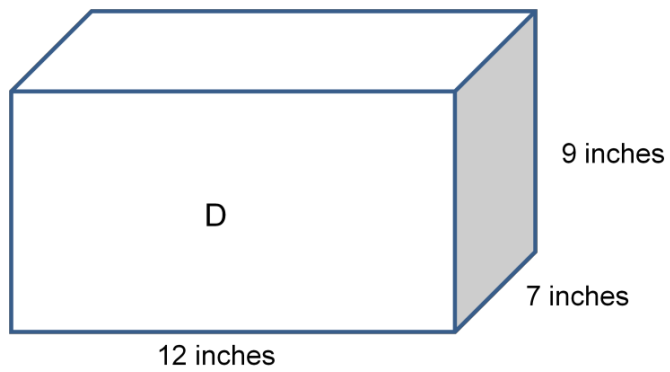
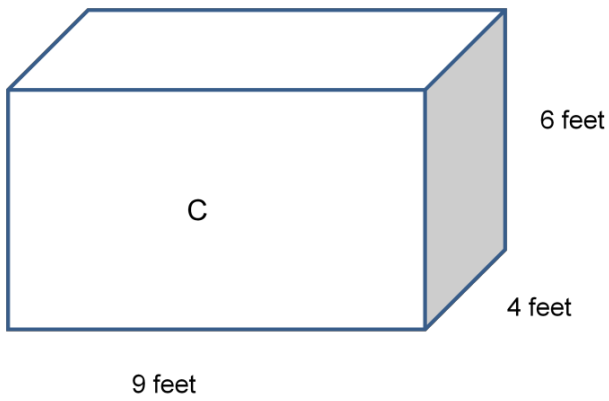
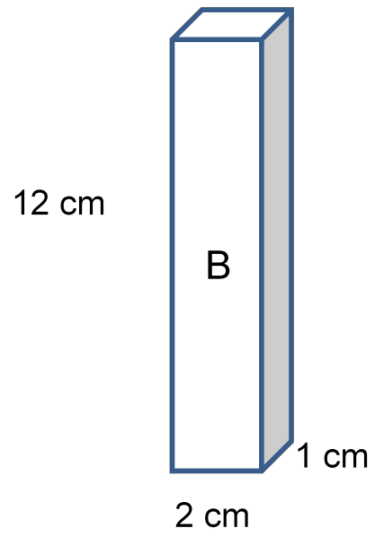
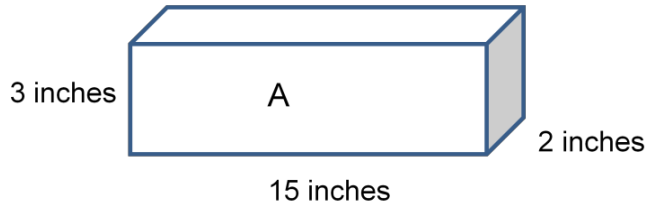
Surface Area

What is the surface area of each of the following shapes? Show your proof!



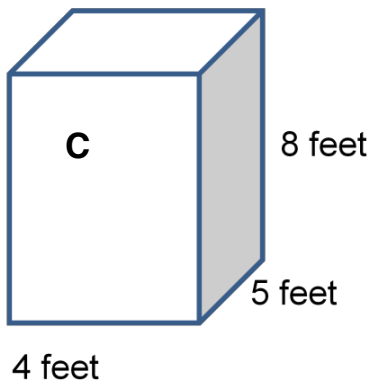
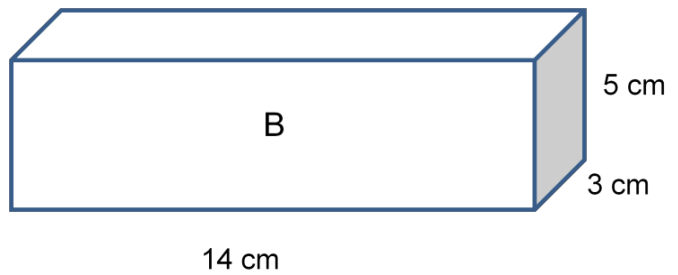
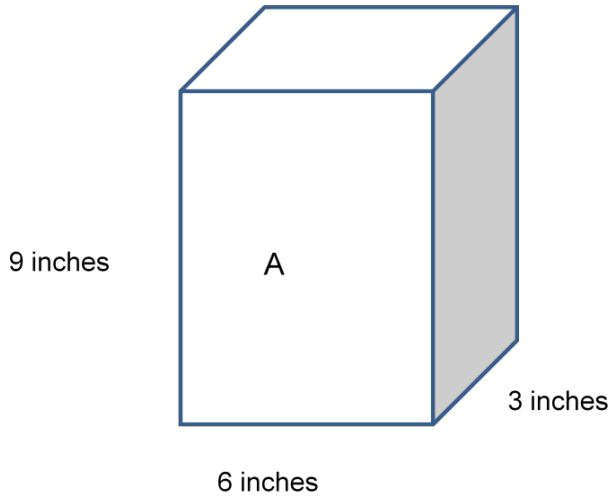
Missing Squares

What is the surface area of each of the following shapes? Show your proof!



More Missing Squares

What is the surface area of each of the following shapes? Show your proof!



Fantastic Formulas

Have you discovered your own formula for surface area of rectangular prisms? Write down all your classmate's formulas below and decide which formulas are valid. Include the formulas that Mr. Klaus' class discovered.

Student formula _____

Student formula _____

Student formula _____

Student formula _____

Polly's formula: $2bh + 2bw + 2wh$ where b stands for the length of the base, h the height, and w the width

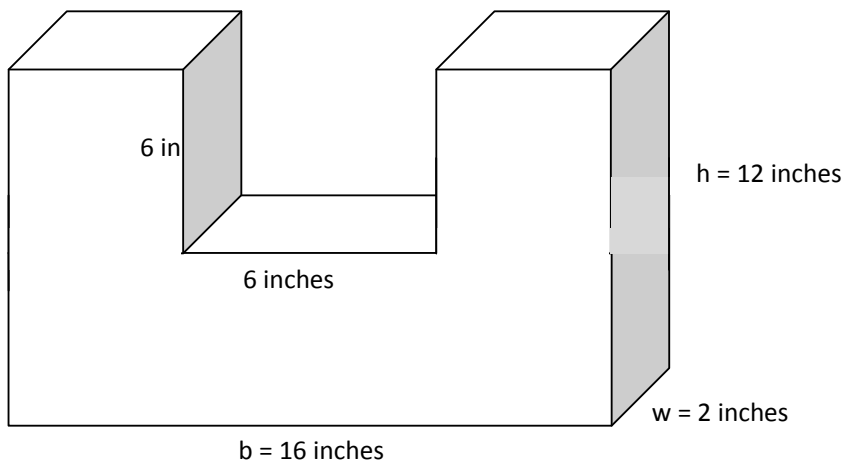
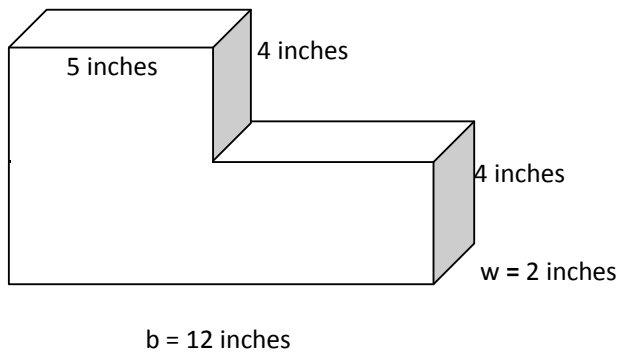
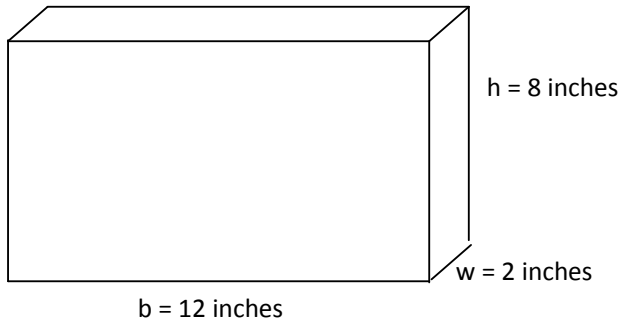
Richard's formula: $6bh$ where b stands for the length of the base, h the height

Carla's formula: $B_F + B_T + B_R$ where B_F stands for the Area of the Front Face, B_T stands for the Area of the Top Base and B_R stands for the Area of the Right Face.

Shape Up

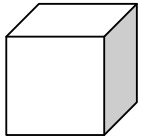
Find the surface area of the following shapes.

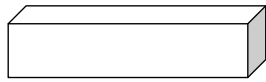
Figures are not drawn to scale.

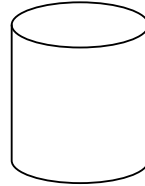


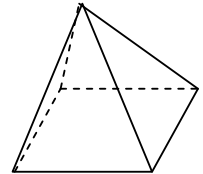
Shadowy Shapes

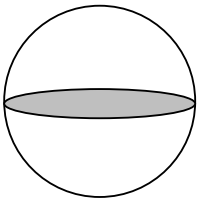
Name the shapes below:

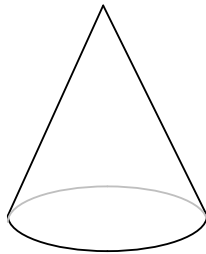


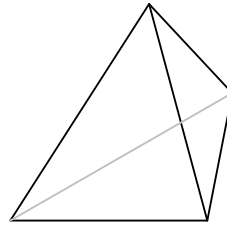


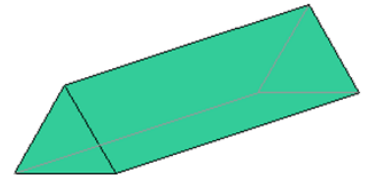










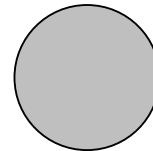


Now that you have played the Shadow Game with your teacher, list all the 3-D shapes that could be represented by each of the following shadows:

a.

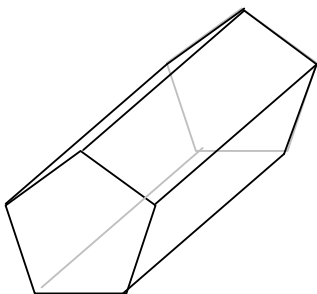
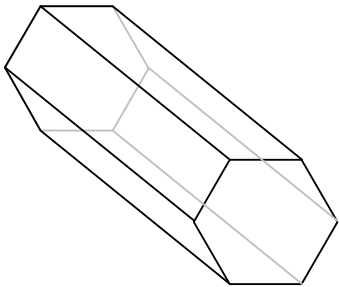
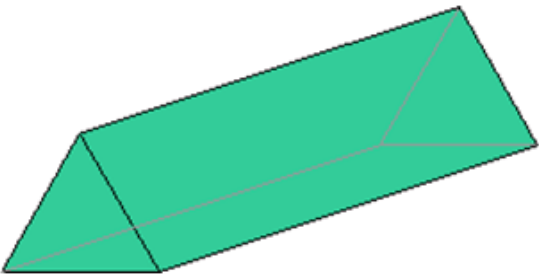


b.



Drawing Wrappers/Shadows

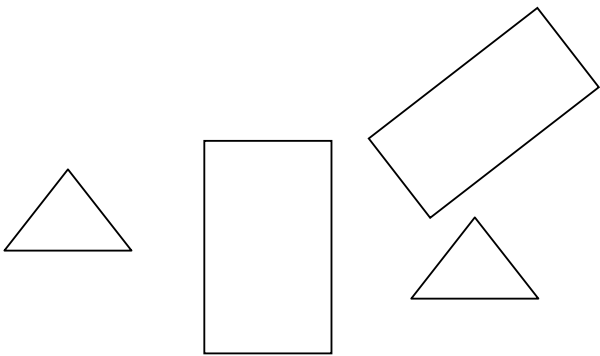
The Cube-i-licious Candy Company decided to make new candy cartons that would hold their candies. Draw the wrappers for each of the following candy cartons.



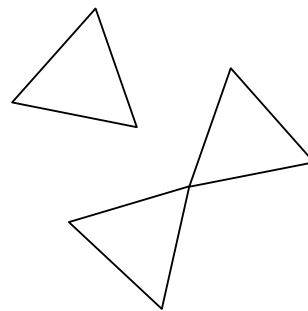
Lost Wrappers

Zöe, one of the employees at Cube-i-licious was making wrappers for these new candy cartons. The wrapper parts were on her desk, but when she went to lunch, Dallin, the practical joker at Cube-i-licious, stole one of the wrapper parts from each candy carton. Can you figure out which wrapper part is missing from each carton below?

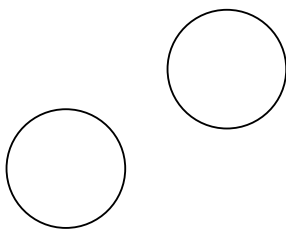
Carton A



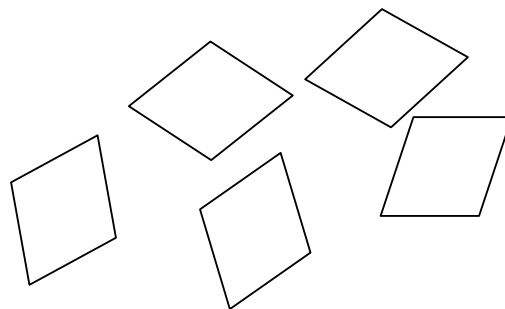
Carton B



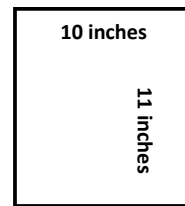
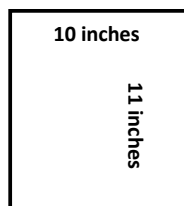
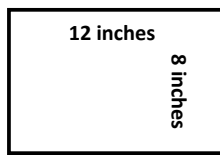
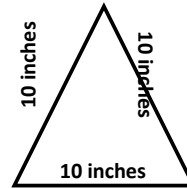
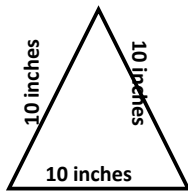
Carton C



Carton D



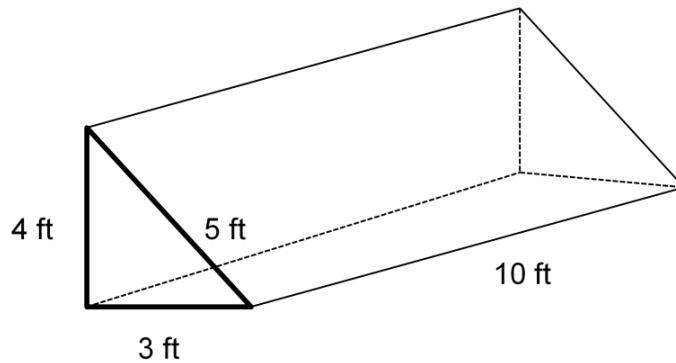
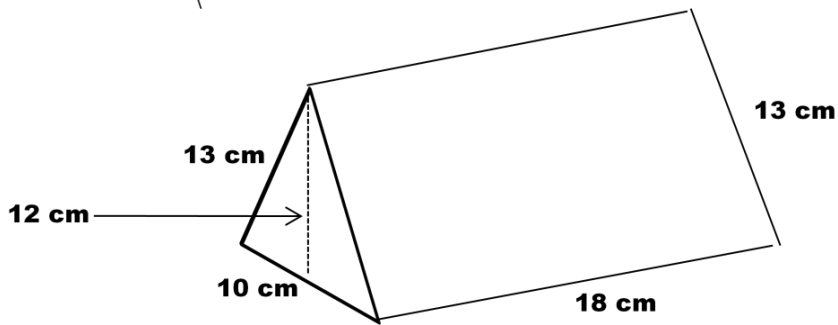
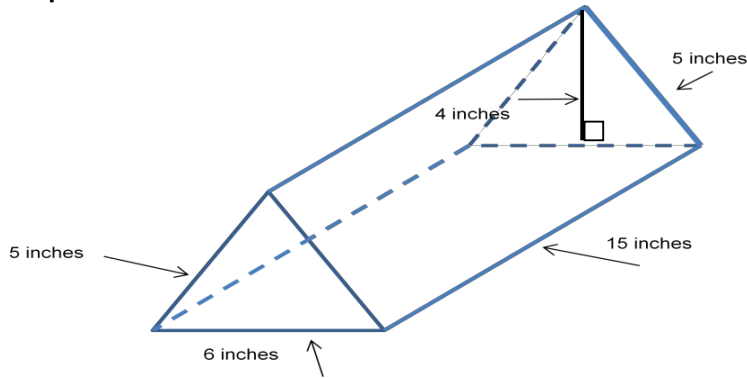
Sam and Sue's Dilemma



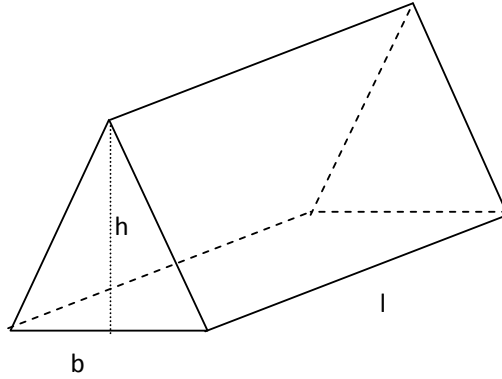
Sam said that these shapes could be used to wrap a triangular prism. Sue said that they could not. Who do you agree with and why?

Surface Area of Other Shapes

Draw all the parts of each shape and find out how many square units it would take to wrap the arrangement of triangular shaped candies!



Fanatic Formulas

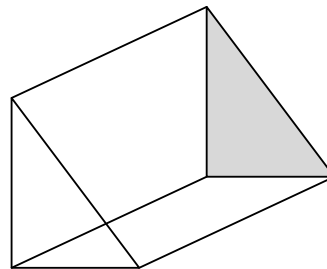
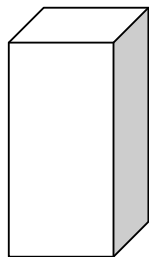


A. Write your own formula for finding the surface area of a triangular prism.

S.A. = _____

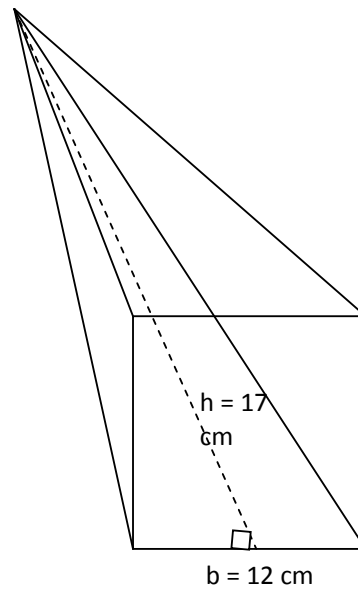
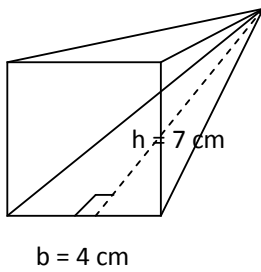
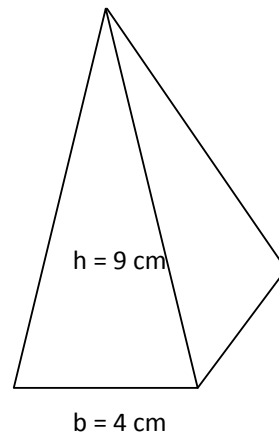
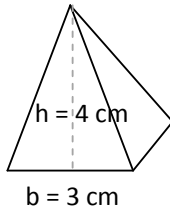
B. Which of the following prisms can use the formula below to find its surface area?

$$S. A. = (\text{Top} + \text{Front} + \text{Right}) \times 2$$



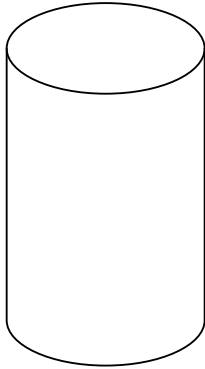
Surface Area of Pyramids

Draw the wrapper of each **square** pyramid and find its surface area.



Surface Area of Cylinders

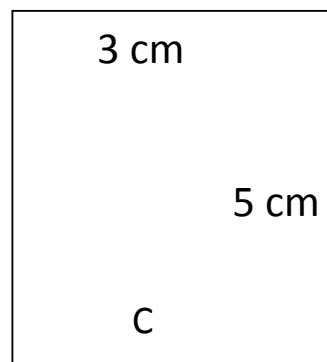
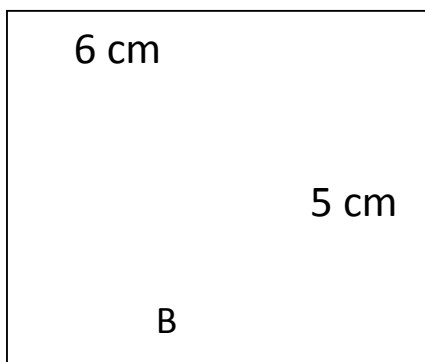
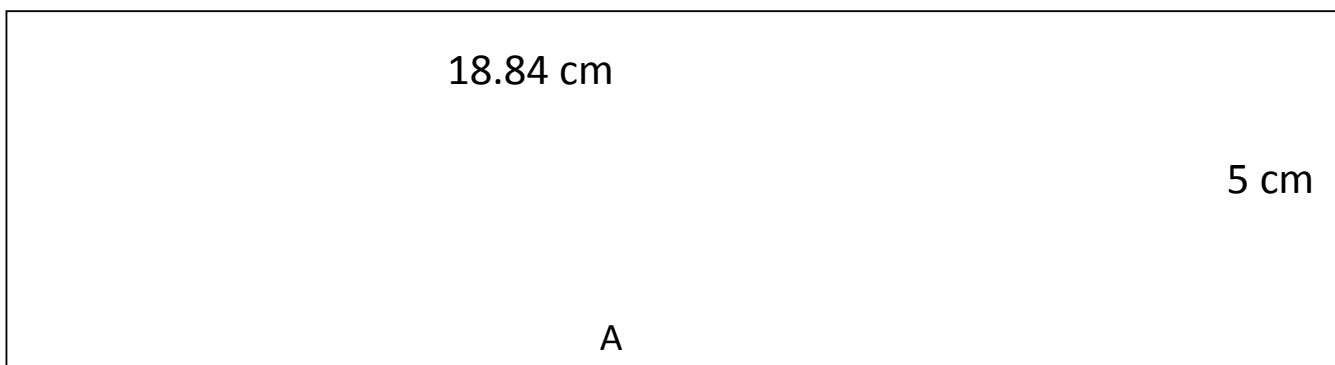
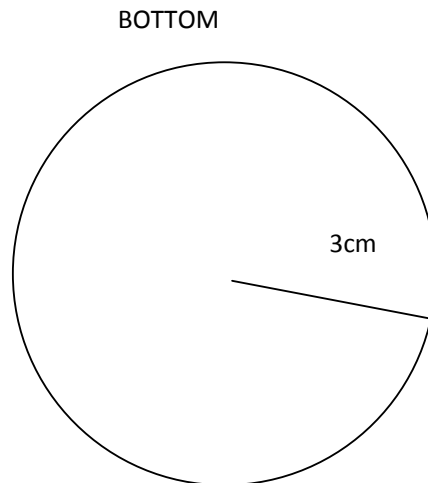
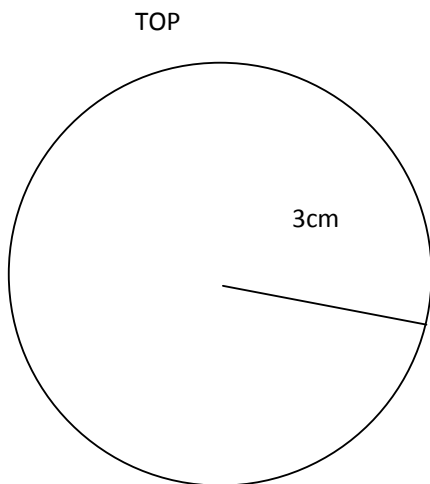
Draw all the parts of the wrapper for the cylindrically shaped candy carton.

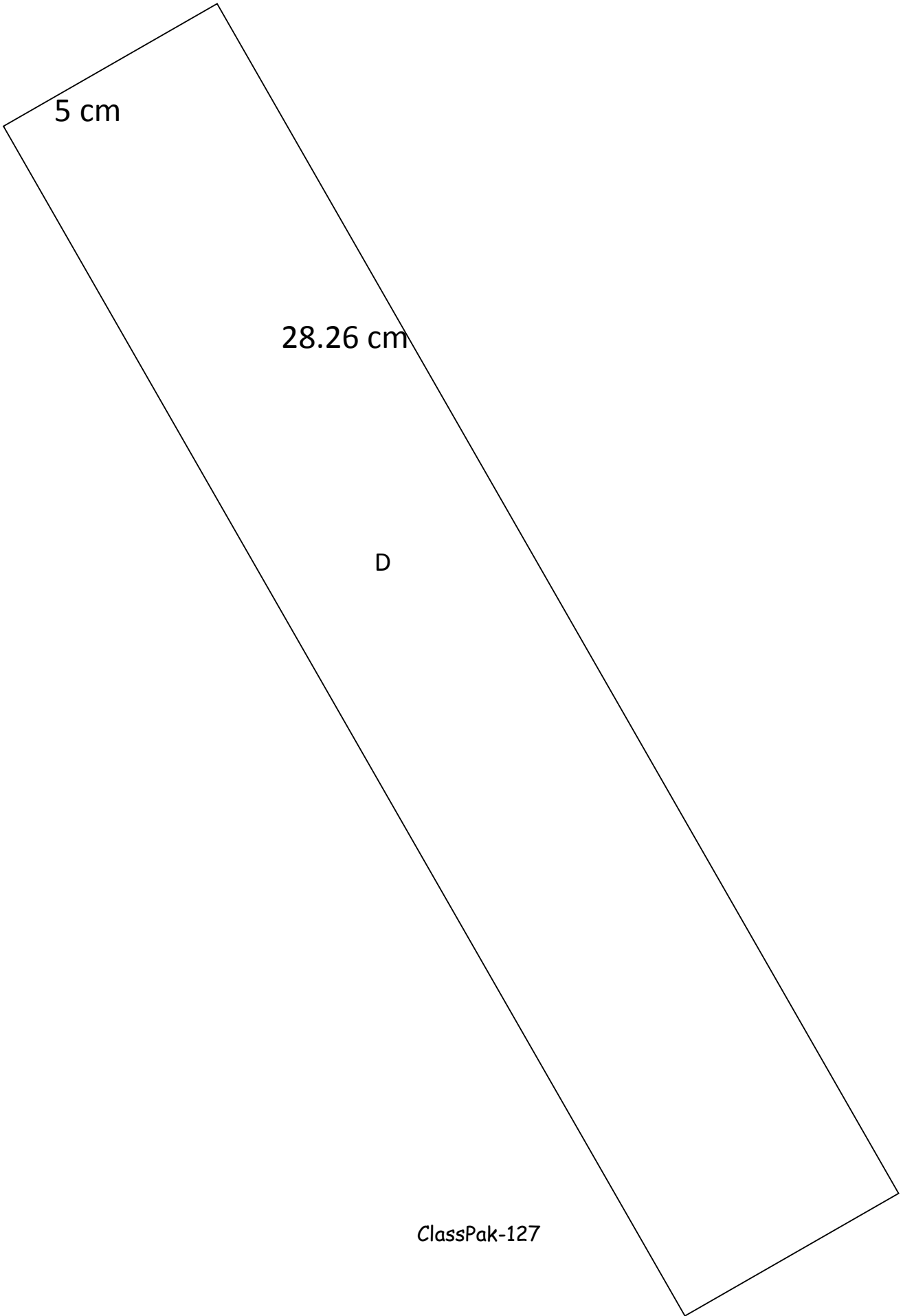


Discuss with your group a strategy for finding the surface area of the cylinder.

STRATEGY:

Which of the following rectangles would make a candy carton with the top and bottom below? (TWO PAGES)

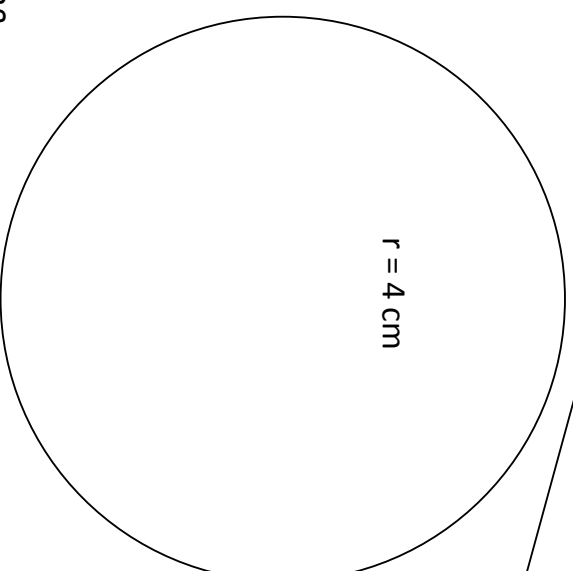
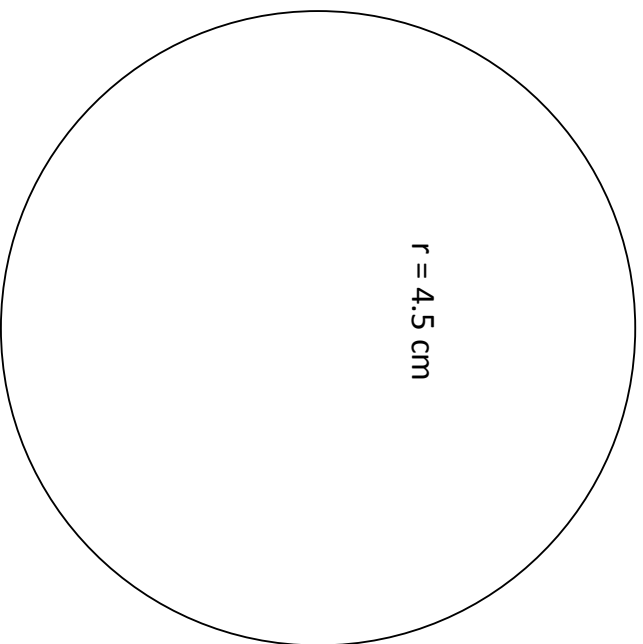
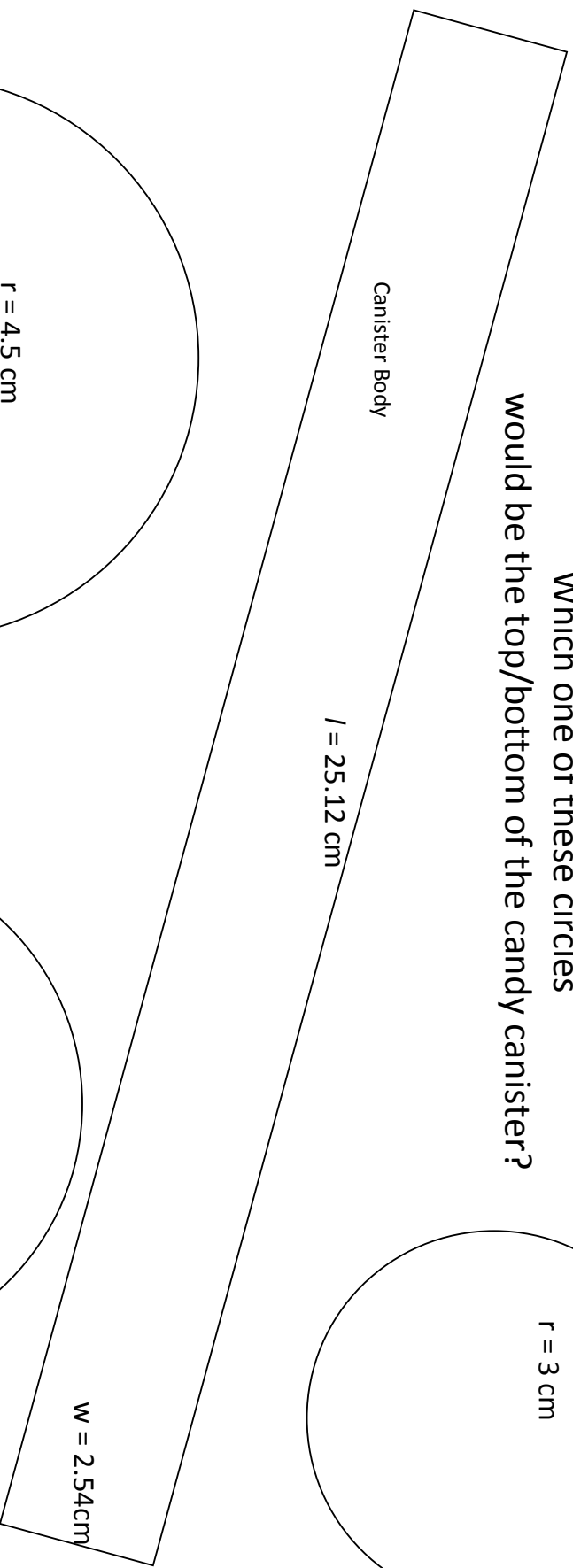
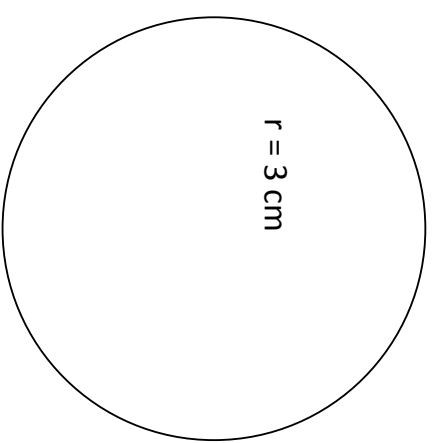




(not drawn to scale)

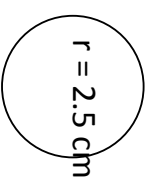
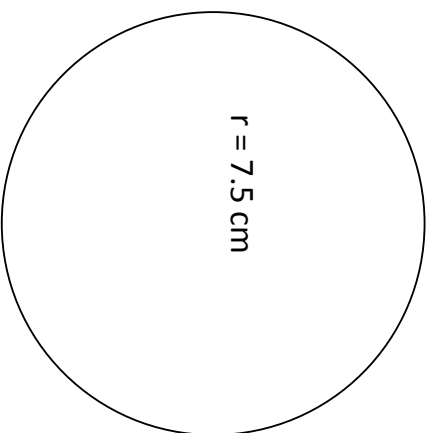
Silly Cylinders

Which one of these circles would be the top/bottom of the candy canister?

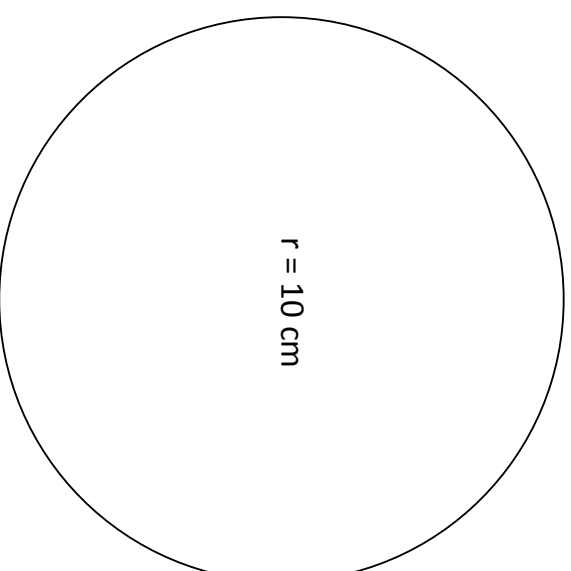
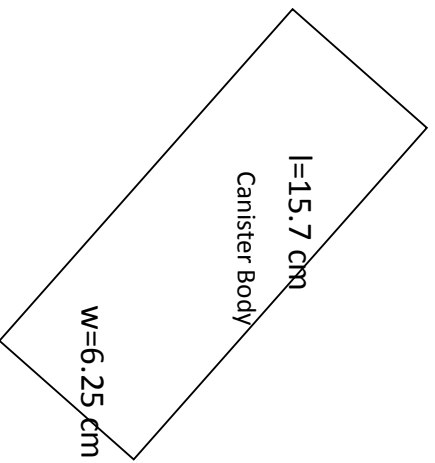


Another Silly Cylinder

Which one of these circles would be the top/bottom of the candy canister?



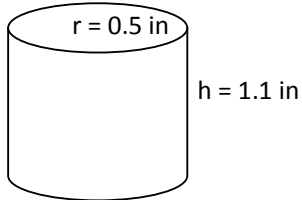
(not drawn to scale)



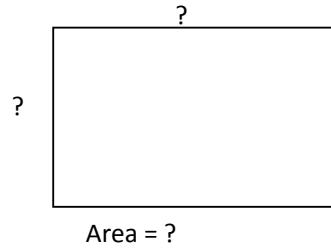
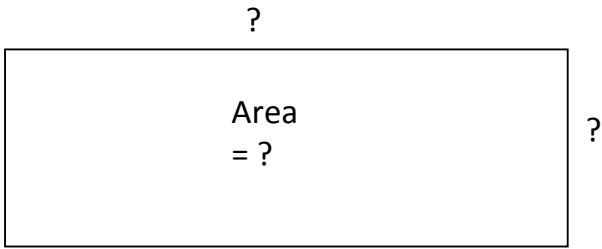
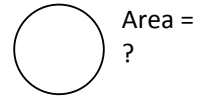
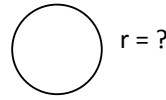
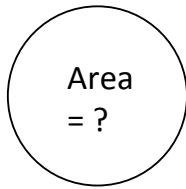
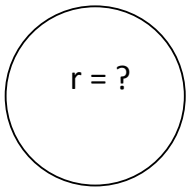
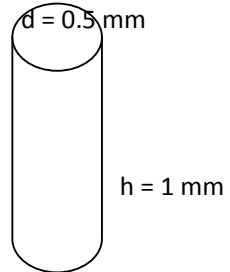
Practice Practice

Fill in the missing dimensions for each cylinder below:

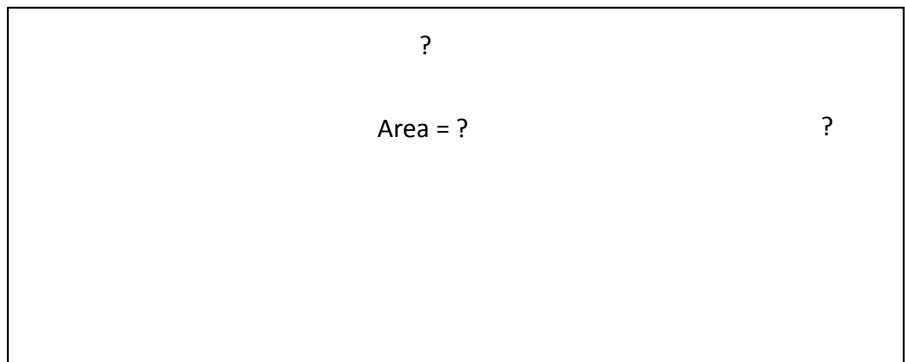
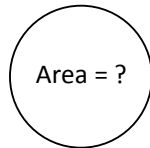
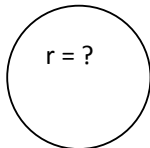
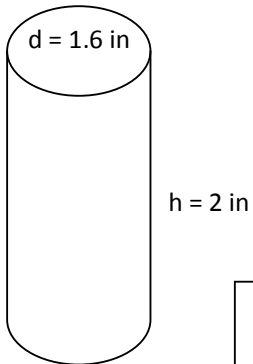
A)



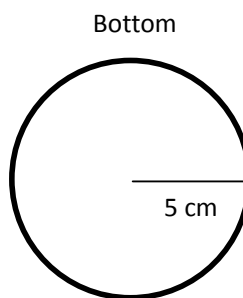
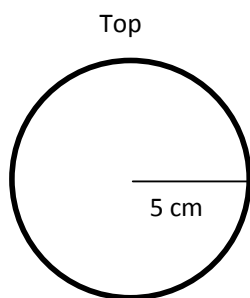
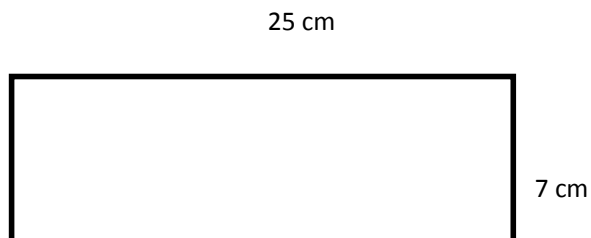
B)



C)



Jimmy said that the rectangle below will wrap around to make the body of a cylinder with top and bottom shown. Do you agree or disagree? What is your evidence?

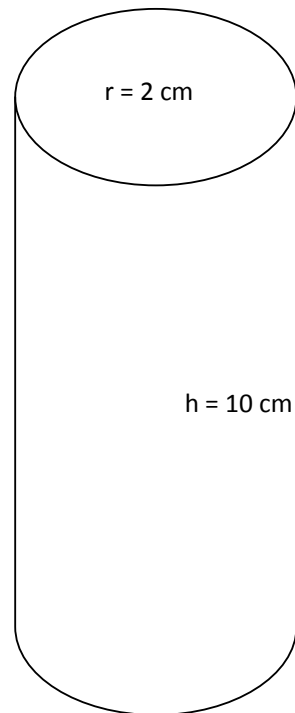
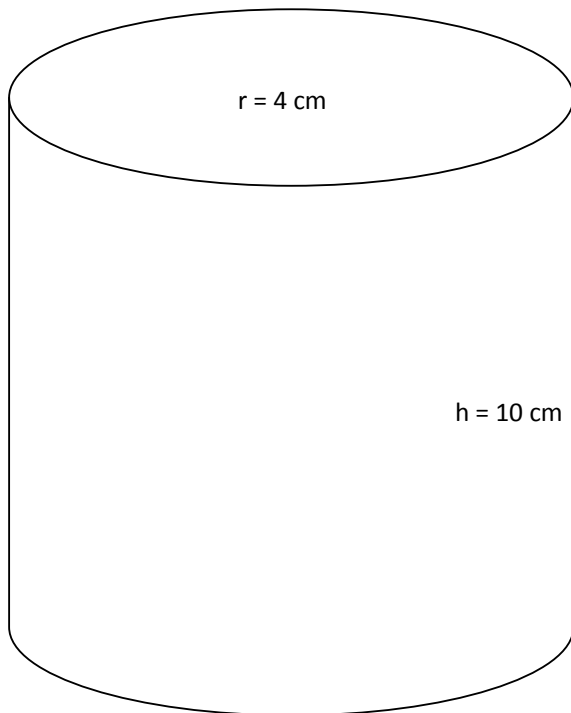
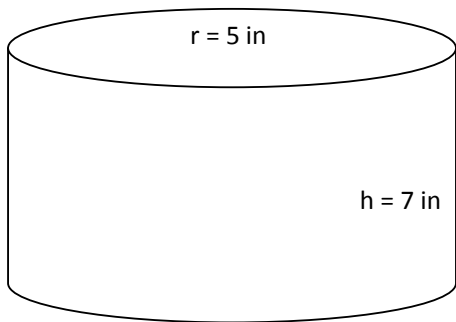


Surface Area of Cylinders

Draw and label all the parts of the wrapper for each shape below, including the dimensions!

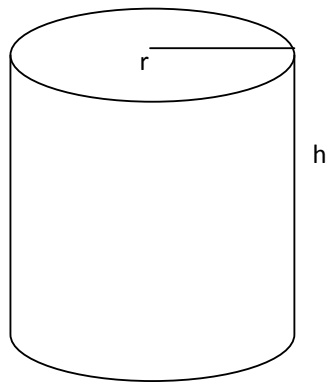
How many square units would it take to make each wrapper?

Figures are not drawn to scale.



Formula page

If you haven't already, create your own formula for the surface area of a cylinder.



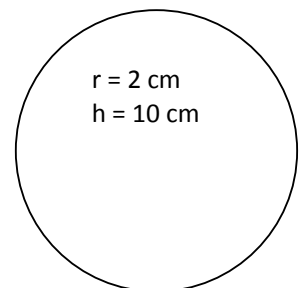
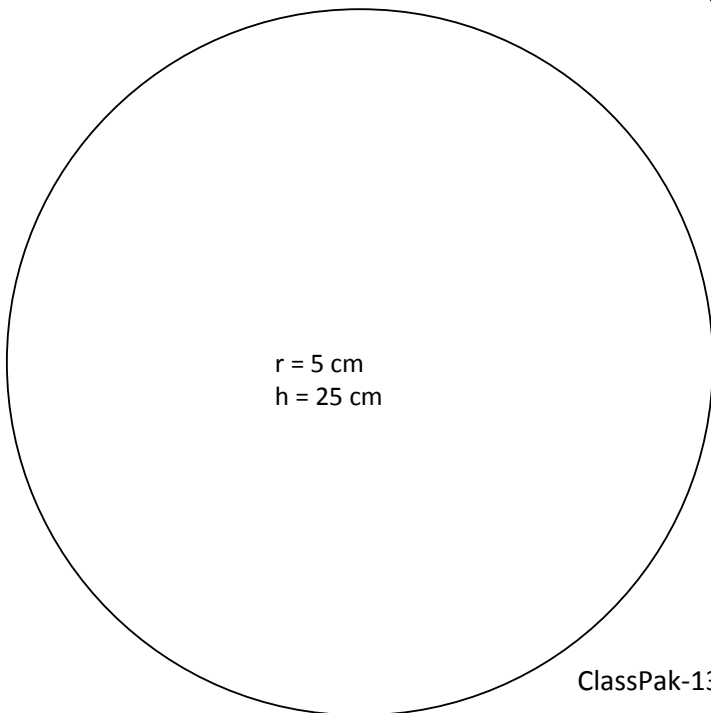
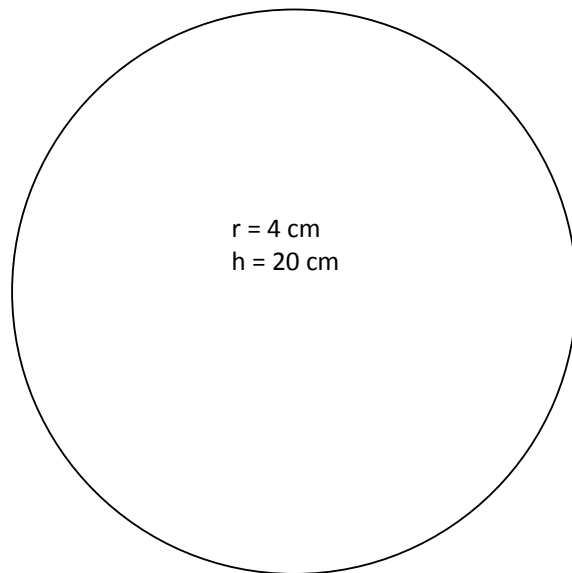
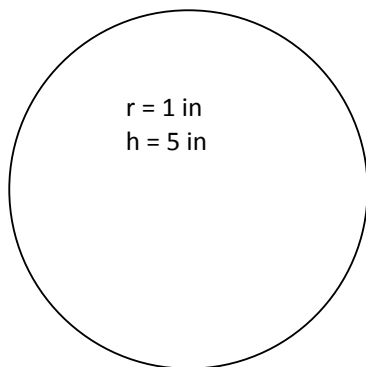
S.A. = _____

Marketing Soda Products

You have been hired by a prestigious marketing firm to create a new soda can for their brand new flavor, *Chocolate Thriller*.

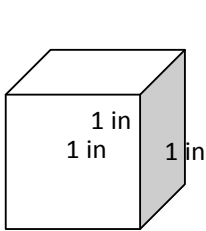
Choose one of the circles below to be your top and bottom, and design a can to fit with their specifications. Put your designs on a piece of paper, including a drawing of the design with the dimensions labeled on it.

1. Cut out the material you need to make the can, rounding to the nearest whole number.
2. Decorate your can and be creative. You want your soda can to be chosen for mass production!
- 3.

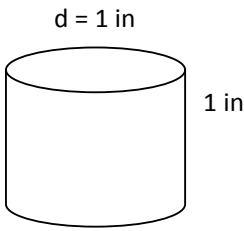


Choosing Cheapest Candy

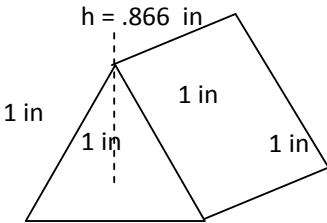
You are trying to decide which shape candy we want to make into a pack and sell. The business department has told us to make the one that will cost the least to distribute. Given that each pack will have the same number of pieces in it, which shape of the candy would require the least amount of material to wrap? Write your evidence below.



Cube Candy



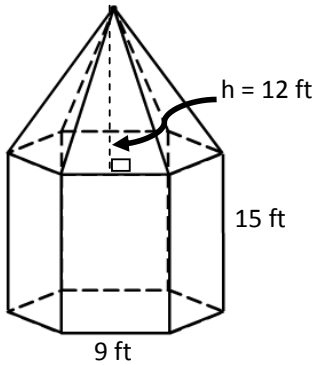
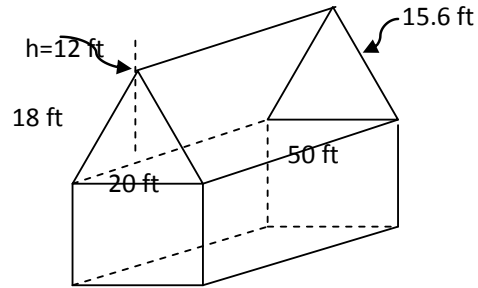
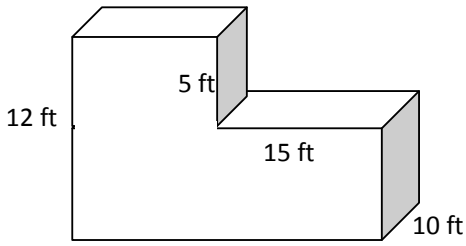
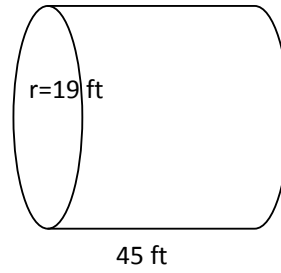
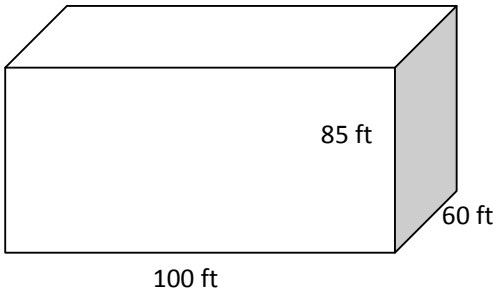
Cylinder Candy



Triangular Candy

Painting Problems

Pauley the Painter is trying to figure out how many gallons of paint he needs to paint the shapes below. Determine how many gallons of paint are needed for each shape if 1 gallon covers 150 ft^2 .



The hexagon is regular.
The area of the base hexagon is 210 ft^2 .

