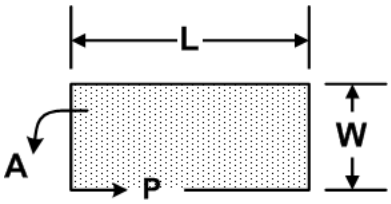
Handout #1

Rocio, we are going to work on the measurement and the calculation of **length or distance** and **area.**

Length or Distance is a ***1 Dimensional Measurement***. It measures how long or short something is.

Area is a ***2 Dimensional Measurement***. It measures how big a **surface** is.

Rectangle

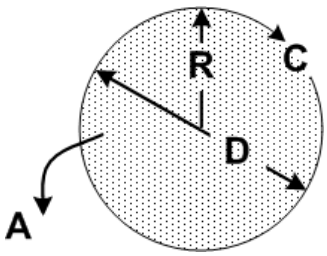


Length (L) and Width (W) are the length of the sides.

Perimeter (P) is the distance around the entire rectangle.

Area (A) is the size of its surface.

Circle



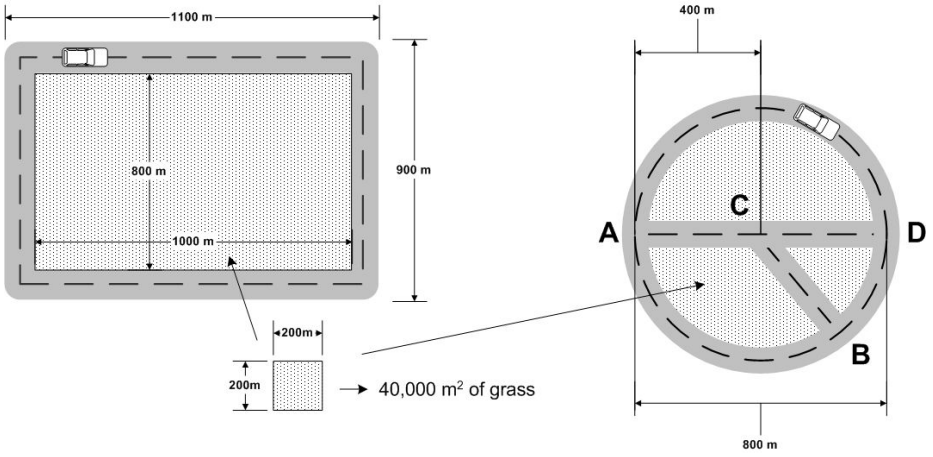
Radius (R) is the distance from the center to the edge.

Diameter (D) is the distance across the circle.

Circumference (C) is the distance around the circle.

Area (A) is the size of its surface.

Below a rectangular and a circular **race track** are shown. Take some colored pencils and show where the **length, width, perimeter, radius, diameter, and circumference** are on the two figures. Also, take a green pencil and color in the grass.



For each of the questions, answer if this is a **length problem** or an **area** problem. Then, if you know how, answer the question:

Q1 If you walk on the outside of the rectangular track, how far do you walk?

Q2 If you have to buy grass to fill in the inside of the rectangular track, how much grass do you have to buy?

Q3 If you have to mow the grass inside of the circular track, how many square meters of grass do you have to mow?

Q4 What is the length of the radius of the circular track?

Q5 What is the length of the diameter of the circular track?

Q6 If you walk around the circular track, how far do you walk?

Q7 What is the Circumference of the circular track?

Q8 If you walk along the inside of the rectangular track, how far do you walk?

Q9 What is the inside perimeter of the rectangular track?

Q10 Is it further to walk around the rectangular track or to walk around the circular track?

Q11 Is there more grass inside of the rectangular track or more grass inside of the circular track?

Q12 Going the same speed, does it take longer to walk the radius or the diameter of the circular track?

1 B-Ball

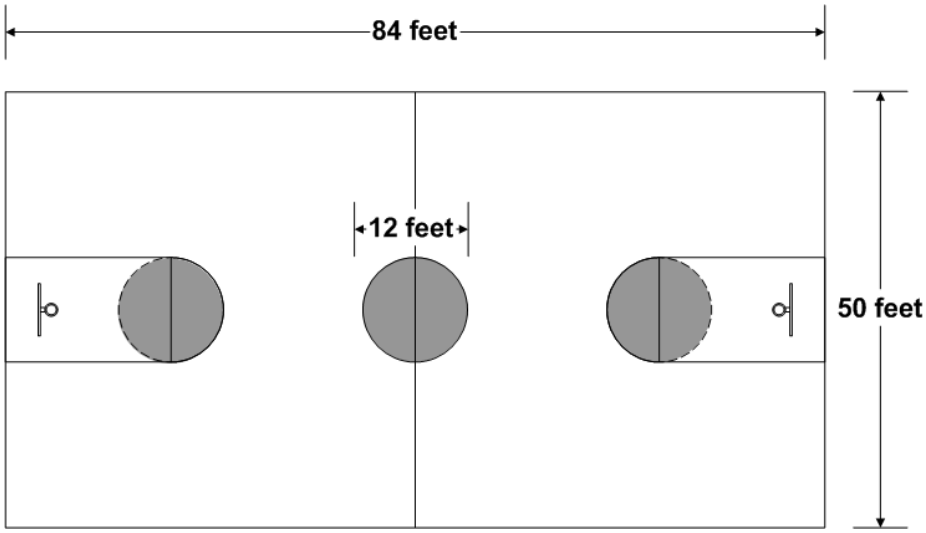
To your right is a basketball court. A high school basket ball court is 84 feet by 50 feet.

Also, there are several circles on a basketball court. Here, we have three that are the same size.

On the drawing, get some colored pencils and label and mark the:

1 Court length.
2 Court width.
3 Court perimeter.
4 A gray circle's radius.
5 A gray circle's diameter.
6 A gray circle's circumference.

Are these measurements of length or area?



Before answering the question, write down whether it is a **length or distance** problem or an **area** problem. Then, if you can, solve. If you cannot, talk to your tutor about why or why not.

Q13 How many square feet of wood flooring do you need for the entire court?

Q14 How far is it around the entire court?

Q15 How many square feet of gray paint do you need to paint the circles?

Q16 Is it further to 1) run around the court one time or 2) to run from the left side to the right side to the left side to the right side and then back to the left side.

Q17 How big is the court?

Q18 How big is a circle?

Q19 What is the diameter of a circle?

Q20 What is the radius of a circle?

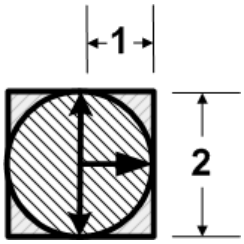
Q21 What is the circumference of one circle?

Q22 What is the area of one circle?

2 Measuring Length and Area

Get some string and get some cutouts and measure the following shapes and fill in the tables to the right.

For the **circle**, try and measure the area **the best you can**. You might now get the exact answer, but still try. Use the cutouts to help you. Remember you can **bound the area** like this:



Circle Area < Square Area = 2 × 2 = 4

When your finished measuring, use the variables **W** for width, **L** for length, **P** for perimeter, **R** for radius, **D** for diameter, **C** for circumference and **A** for area. Then make ***formulas*** that relate the variables together. For the circle, you may need to use the mathematical constant **π** (which is spelled out 'pi' and pronounced 'pie').

If you can't get it exactly, just **try your best**. If you need to, ask your tutor for help.

Formulas for Rectangle

Perimeter:

Area:

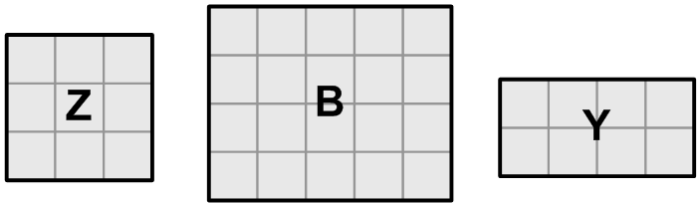
Formulas for Circle

Diameter (in terms of R):

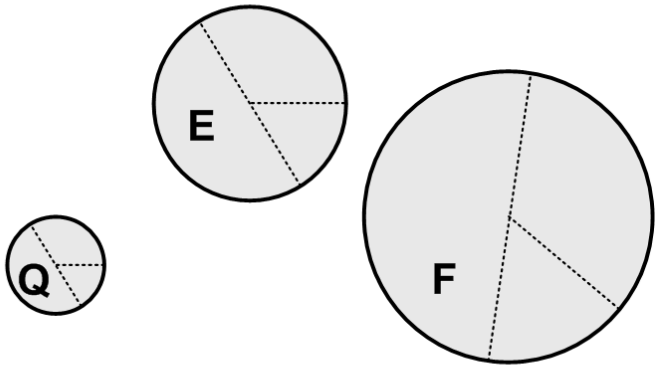
Radius (in terms of D):

Circumference (in terms of D):

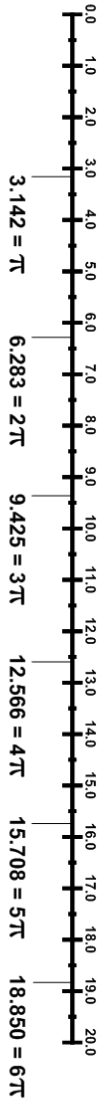
Area (in terms of R):



Shape	Length	Width	Perimeter	Area
Z				
B				
Y				

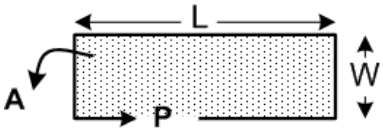


Shape	Radius (R)	Diameter (D)	Circumference (C)	Area (A)
Q				
E				
F				



3 Cheat Sheet

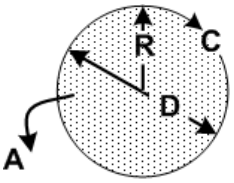
Rectangle



$P = 2L + 2W$

$A = L \times W$

Circle



$D = 2 \times R = 2R$

$C = \pi \times D = \pi D$

$A = \pi \times R^2 = \pi R^2$

Remember!

π is just a number!

In fact it's defined as ***the ratio of a circle's circumference to a circle's diameter***. That is:

$$\pi = \frac{C}{D}$$

π actually goes on forever:

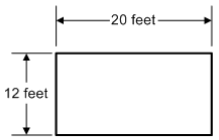
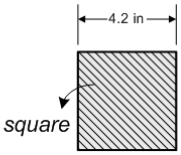
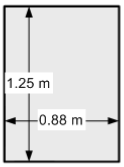
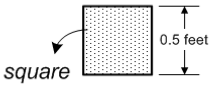
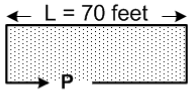
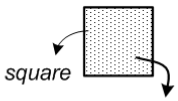
π = 3.141592653589793238 . . .

But most of the time, you can use an **approximate or rounded value:**

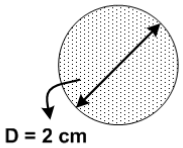
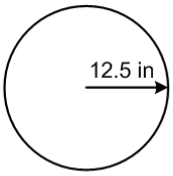
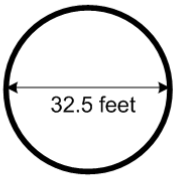
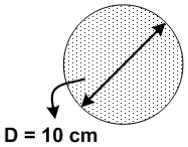
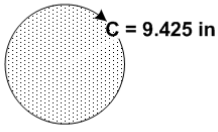
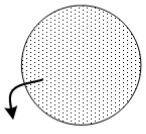
π = 3.142

Solve the following problems with your tutor:

Rectangles

 L = W = P = A =	 L = W = P = A =
 L = W = P = A =	 L = W = P = A =
 **P = 200 feet** L = W = P = A =	 **A = 100 cm²** L = W = P = A =

Circles

 **D = 2 cm** R = D = C = A =	 R = D = C = A =
 R = D = C = A =	 **D = 10 cm** R = D = C = A =
 **C = 9.425 in** R = D = C = A =	 **A = 75.540 cm²** R = D = C = A =

Handout #1

-- scratch paper --

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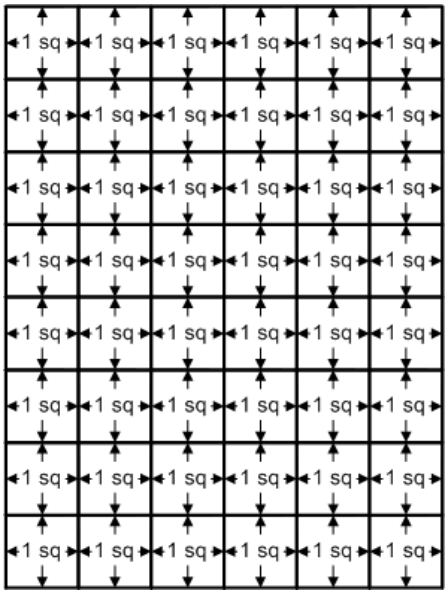
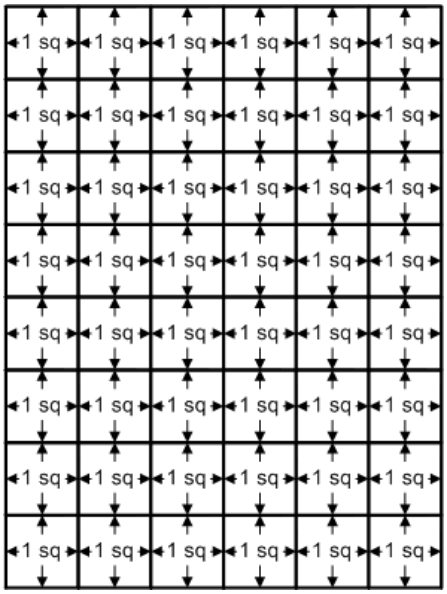

1 sq


1 sq