The Metric System

a) **Linear Measurements**

Obtain a metric ruler. Notice that it is divided into about 15 centimeters (cm). It is a 6 inch ruler and there are 2.54 cm in each inch. Each centimeter is divided into 10 millimeters (mm). The rule for reading any instrument is to read it to the nearest tenth of the smallest division. In this case that is a tenth of a millimeter. This is an estimated number called the Least Significant Digit. When you measure something with this ruler, the number should look something like 2.35 cm which can also be written as 23.5 mm or 0.0235 m. They all have 3 significant measured digits or 3 sig figs. When using a ruler, be careful that you line up the zero on the ruler with the start of the line. The zero is not always at the end of the ruler but is usually a little way in.

Fill out the Table below by measuring the lengths of the lines, giving your answer in cm, mm and m to the correct number of sig figs

A   _____

B   _____

C   _____

D   __

E   _____

F   _____

G   _____

H   _____

I   ____

J   _____

K   _____

L   ____

	cm	mm	m	Significant digits
A				
B				
C				
D				
E				
F				
G				
H				
I				
J				
K				
L				

Draw a horizontal line of the given length next to the numbers below:
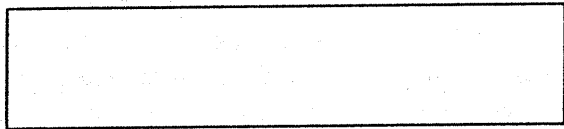
2.55 cm

12.65 mm

0.1285 m

When numbers are multiplied or divided, the answer is rounded off to the lowest number of sig figs in the numbers
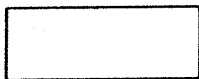
So 2.5 x 6.06 comes to 15.15 but it has to be rounded off to 2 sig figs or just 15 because 2.5 has 2 sig figs

Measure the sides of the rectangles below and record them in the table. Find the areas of the rectangles to the correct number of sig figs. Work them out in cm^2 and m^2
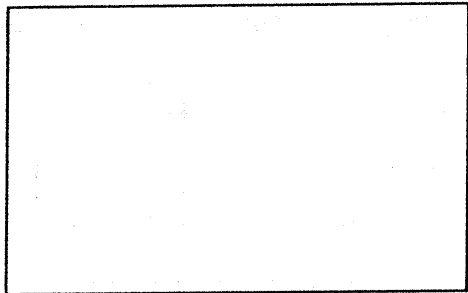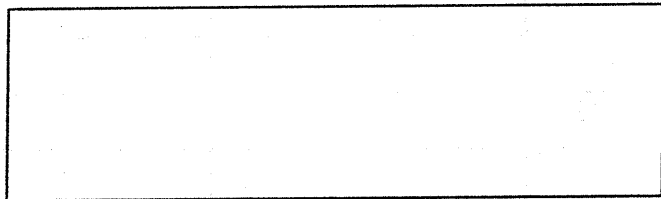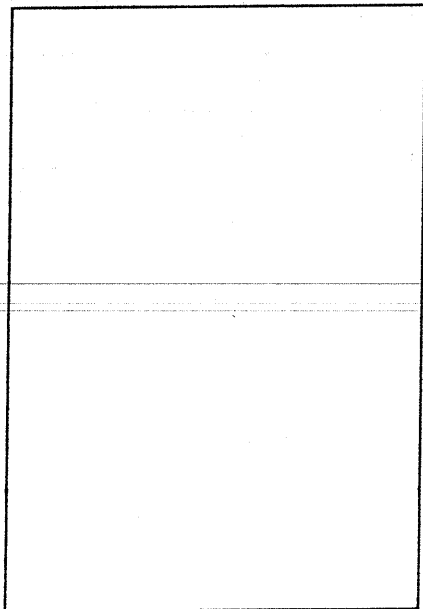
A

B

C

D

E

	Height (cm)	Width (cm)	Area (cm^2)	Area (m^2)
A				
B				
C				
D				
E				

When adding or subtracting numbers, the answer is rounded off to the least number of decimal places. So 2.3 + 6.55 is calculated to be 8.85 but must be rounded off to the least decimal place which is a tenth (2.3) so the final answer is 8.9 since the 5 rounds up the 8 to a 9.

Calculate the perimeter in cm to the correct number of sig figs of each box above

A

B

C

D

E

Calculate the total length of all the lines in cm for number 1 to the correct number of sig figs

Total Length =

Calculate the total area of all the boxes above in cm^2 to the correct number of sig figs

Total Area =

b)   Mass Measurements
        Mass is measured in kilograms (kg). A kilogram is 2.2 pounds. It is measured with a balance of some kind which often is given in grams (g). A kg is 1000 g.

Mass yourself in pounds and convert it to kg and grams to the correct number of sig figs.

Pounds (lbs)	kg	g

c)   Time Measurements
        Time is measured in seconds (s).

Find your pulse (yes, you have one) and count your number of pulses for one minute. Calculate the time for one heartbeat.

Pulses per 60 seconds =   Time for one heartbeat (seconds per pulse) =