

# 1. Approximation and errors

1. The length and breadth of a rectangular room are 15cm and 12 cm respectively. If each of these measurements is liable to 1.5% error, calculate the absolute error in the perimeter of the room  
(3 mks)
2. The length and width of a rectangle are stated as 18.5cm and 12.4cm respectively. Both measurements are given to the nearest 0.1cm.
  - a) Determine the lower and upper limit of each measurement. (1 mark)
  - b) Calculate the percentage error in the area of the rectangle. (3 marks)
3. The top of a table is a regular hexagon. Each side of the hexagon measures 50.0cm Find the maximum percentage error in calculating the perimeter of the top of the table  
(3mks)
4. A rectangular room has length 12.0 metres and width 8.0 metres. Find the maximum percentage error in estimating the perimeter of the room.
5. In this question mathematical tables or calculator should not be used. The base and perpendicular height of a triangle measured to the nearest centimeters are 12cm and 8cm respectively; Find ;
  - (a) the absolute error in calculating the area of the triangle
  - (b) the percentage error in the area, giving the answer to 1 decimal place
6. A rectangular plate has a perimeter of 28cm. determine the dimensions of the plate that give the maximum area
7. A wire of length 5.2m is cut into two pieces without wastage. One of the pieces is 3.08m long. What is the shortest possible length of the second piece?
8. The dimensions of a rectangle are 10cm and 15cm. If there is an error of 5% in each of the Measurements. Find the percentage error in the area of the rectangle.
9. Find the products of 17.3 and 13.8. Find also the percentage error in getting the product.
10. The mass of a metal is given as 14kg to the nearest 10g. Find the percentage error in this measurement.
11. Complete the table below for the functions  $y = \cos x$  and  $y = 2 \cos (x + 30^\circ)$  for  $0^\circ \leq X \leq 360^\circ$

X	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
Cos X	1	0.87	0.5		-0.5	0.87	-1.0		0.5	0		0.87	1
2 cos (x+ 30°)	1.73		0	-1.0		-2.0	-1.73	-1.0		1	1.73	2.00	1.73

- a) On the same axis, draw the graphs of  $y = \cos x$  and  $y = 2 \cos (x + 30^\circ)$  for  $0^\circ \leq X \leq 360^\circ$  b)
  - i) State the amplitude of the graph  $y = \cos x^\circ$ 
    - ii) State the period of the graph  $y = 2 \cos (x + 30^\circ)$
  - c) Use your graph to solve  $\cos x = 2 \cos (x + 30^\circ)$
12. Given that  $8 \leq y \leq 12$  and  $1 \leq x \leq 6$ , find the maximum possible value of:

$$\frac{y+x}{y-x}$$