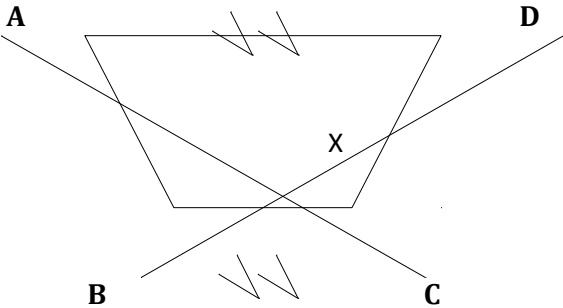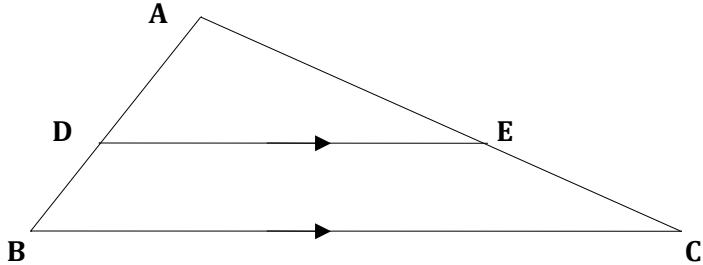NAME _____ INDEX NUMBER _____

SCHOOL_____ DATE_____
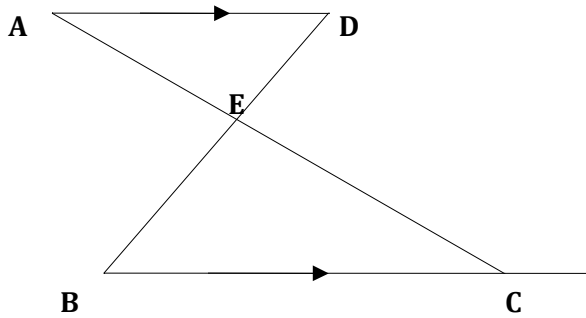
SIMILARITY AND CONGRUENCY

KCSE 1989 – 2012 Form 2 Mathematics	Working Space
1. **1989 Q15 P2** In the figure below, **ABCD** is a cyclic quadrilateral and BC is parallel to AD. Show that triangle ABX is congruent to triangle DXC. (4 marks) 	
2 **1990 Q7 P2** In the triangle ABC shown below DE is parallel to BC. If AE = 3cm and EC = 2cm, determine the ratio of the triangle ADE to that of the triangle ABC. (2 marks) 	

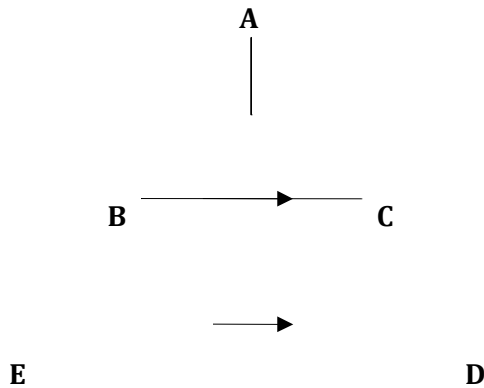|		
3	**1991 Q6 P1** In the figure below AD // BC. AC and BD intersect at E. Given that AE: EC = 1:5 and BD =12 cm, calculate the length of DE. A ————————► D E B ————————► C (3 marks)	
4	**1992 Q5 P1** In the figure above, triangle ABC is similar to triangle AED and BC // ED. Given that the ratio AB: AE = 2:5, find the ratio of the area of triangle ABC to that of the trapezium BCDE. (3 marks) A B ————► C ————► E D	

|		Working Space

5	**1992 Q21 P1**
	In the figure given below (not drawn to scale) DC is a tangent to the circle centre O. AOBC is a straight line.
	
	D
	
	6cm
	
	O
	
	O
	
	A **B** **4cm** **C**
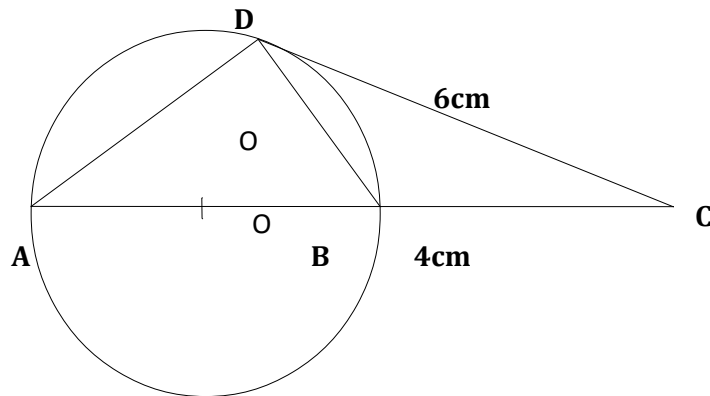	
	(a) Show that ΔADC is similar to Δ DBC.
	(b) Given that BC = 4cm AND DC = 6cm, calculate
	      (i) the length of AB (3 marks)
	      (ii)the size of angle ACD (2 marks)	

6	**1992 Q15 P2** In the figure below, the chord AB and CD intersect at E. Show that ΔAED is similar to ΔBEC. C A E B D	
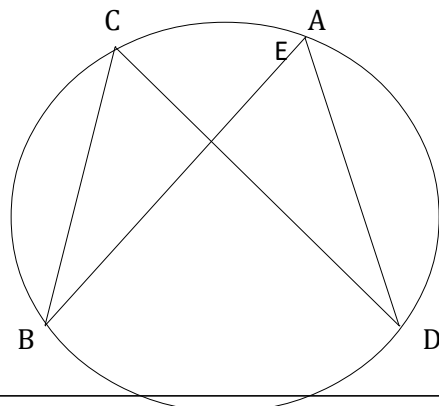
		(3 marks)

Working   Space

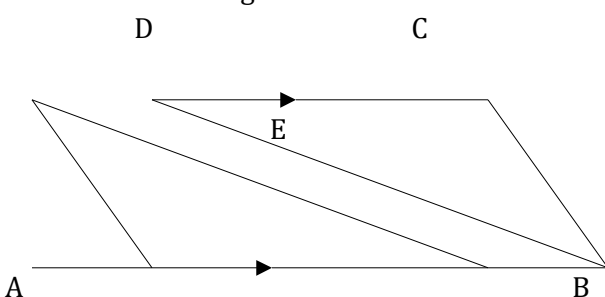| 7 | **1993 Q16 P1**
In the triangle ABC below AC=8cm, BC=5cm and angle BCA = 30^0. Point D divides BC in the ratio 1:4 and point E divides AC in the ratio 2:3. Find the area of the quadrilateral ABDE   (3 marks)
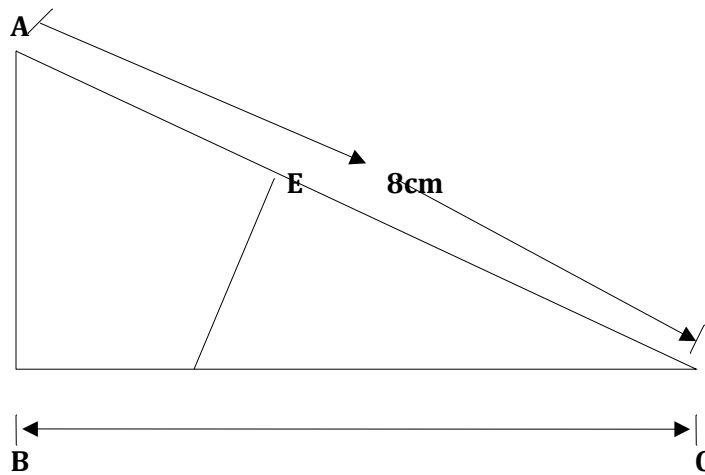
A
E   8cm
B   C | |

| 8 | **1993 Q2 P2**
A football tube in the form of a sphere is inflated so that its radius increases in the ratio of 4:3. Find the ratio in which the volume is increased | |

	(2 marks)	Working Space
9	**1994 Q9 P9** A container of height 30cm has a capacity of 1.5 litres. What is the height of a similar container of capacity 3.0 m^3? (3 marks)	
10	**1995 Q7 P2** The ratio of the lengths of the corresponding sides of two similar rectangular water tanks is 3:5. The volume of the smaller tank is 8.1 m^3. Calculate the volume of the larger tank. (3 marks)	
11	**1996 Q10 P2** Pieces of soap are packed in a cuboid container measuring 36cm by 24cm by 18cm. Each piece of soap	

is similar to the container. If the linear scale factor between the container and the soap is $^1/_6$, find the volume of each piece of soap.

Working   Space

(2 marks)

12	**2002 Q15 P2** In the diagram below, ABCD is a trapezium with AB parallel to DC. The diagonals AC and BD intersect at E.

D   C

E

A   B

a) Giving reasons show that triangle ABE is similar to triangle CDE.
b) Giving that AB = 3DC, find the ratio of DB to EB.

(2 marks)

13 **2005 Q8 P2**
The volumes of two similar solid cylinders are 4752 cm^3 and 1408 cm^3.   If the area of the curved surface of the smaller cylinder is 352 cm^2, find the area of the curved

surface of the larger cylinder.

Working   Space

| 14 | **2009 Q21 P1**
A glass in the form of a frustum of a cone, is represented by the diagram below. The glass contains water to a height of 9 cm. The bottom of the glass is a circle of radius 2 cm while the surface of the water is a circle of radius 6 cm.

(a) Calculate the volume of the water in the glass.
(b) When a special marble is submerged into the water in the glass, the water level rises by 1 cm.
Calculate :
    (i) the volume of the marble   (4 marks)
    (ii) the radius of the marble   (3 marks) | |

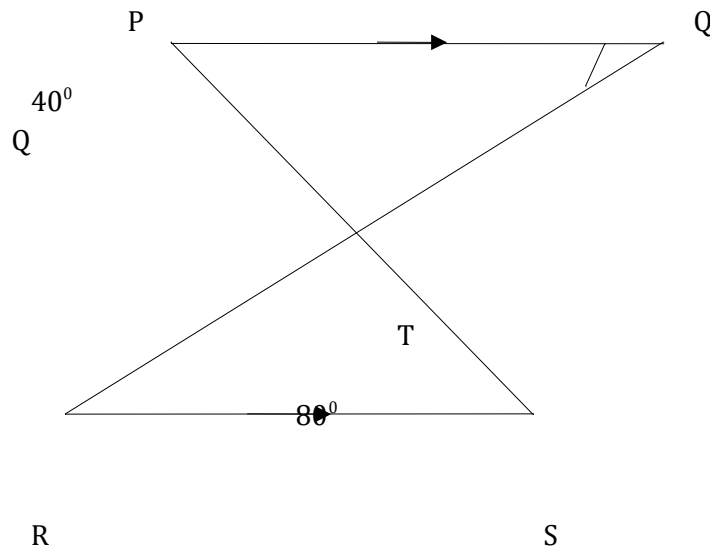|		
15	**2011 Q 16 P1** A small cone of height 8 cm is cut off from a bigger cone to leave a frustum of height 16cm. If the volume of the smaller cone is 160cm3, find the volume of the frustum (3 marks)	Working Space

16	**2012 Q24 P1**
	In the figure below, PQ is parallel to RS. The lines PS and RQ intersect at T. RQ = 10 cm, RT: TQ = 3.2, angle PQT= 40^0 and angle RTS = 80^0.
	
	P Q
	40^0
	Q
	
	          T
	       80^0
	R S
	
	(a) Find the length of RT. (2 marks)	

(b) Determine, correct 2significant figures:
    (i)   The perpendicular distance between
          PQ and RS;   (2 marks)
    (ii)   The length of TS   (2 marks)
(c) Using the cosine rule, find the length of RS
    correct to 2significant figures.   (2 marks)
(d) Calculate correct to one decimal place, the
    area of triangle RTS.   (2 marks)