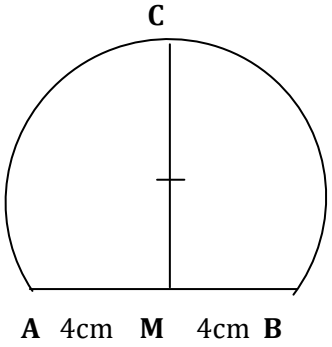
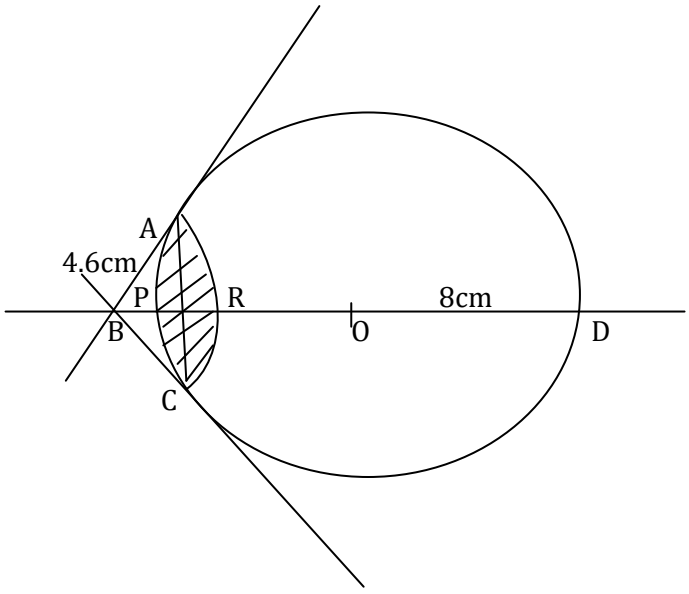
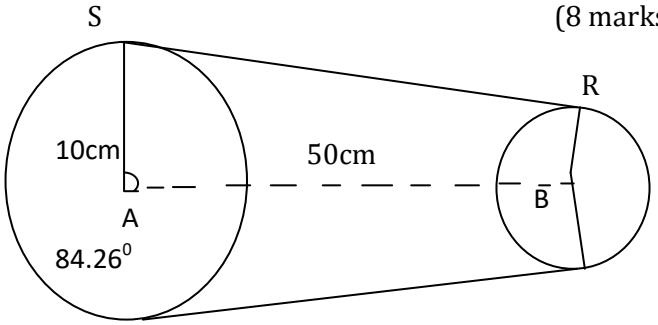
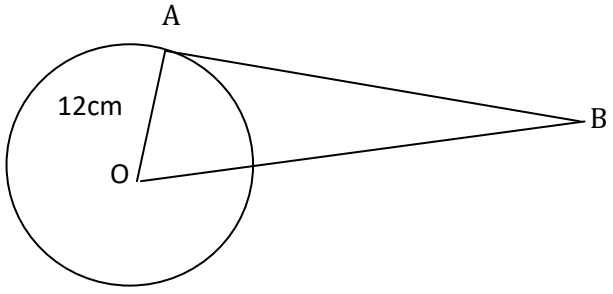
NAME _____ **INDEX NUMBER** _____

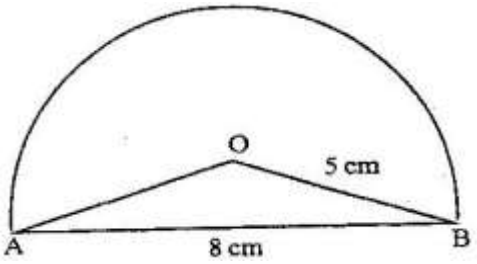
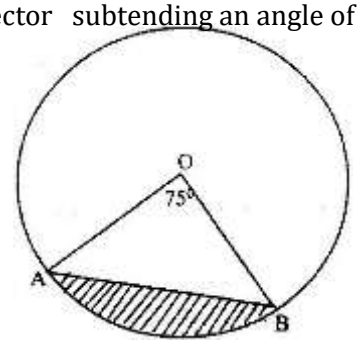
SCHOOL _____ **DATE** _____

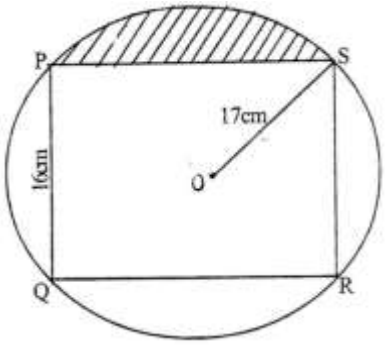
CIRCLES, CHORDS AND TANGENTS

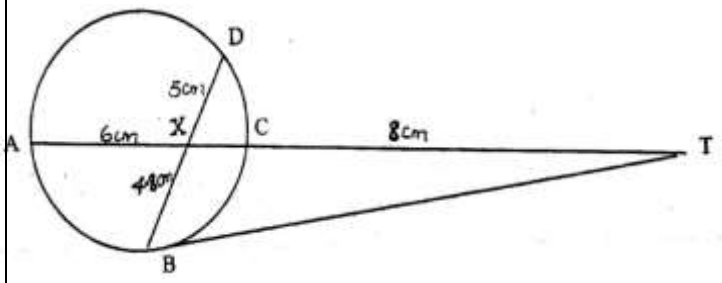
KCSE 1989 – 2012 Form 3 Mathematics		Working Space
1.	**1989 Q24 P2** The figure below represents the cross section of a metal bar.  The cross section is in the form of a major segment of a circle. M is the midpoint of AB and CM is perpendicular to AB. Given that AB = CM = 8cm. Calculate the area of the cross section (8 marks)	
2	**1990 Q20 P1** Two solid spherical balls with centres P and Q touch each other. The balls lie inside and in contact with a hemispherical bowl of centre R. Given that PQ = 13cm, QR = 16cm and PR = 19cm, calculate the radii of the bowl and the two spherical balls. (8 marks)	

		Working Space
3	**1992 Q8 P2** A chord AB of length 13cm subtends an angle of 67^0 at the circumference of a circle centre O. Find the radius of the circle. (4 marks)	
4	**1993 Q24 P1** In the figure below O is the centre of a circle whose radius is 8cm. BA and BC are tangents to the circle. PD is a diameter of the circle and AC is a chord of length 8cm.Angle ABC = 120^0.ARC is of a circle centre centre B and radius 4.6 cm.  Calculate the area of the shaded region (8 marks)	

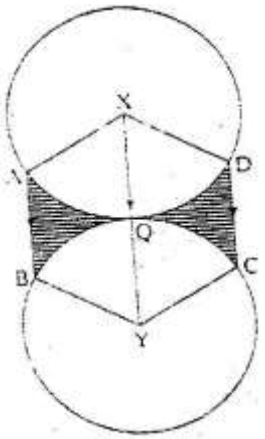
		Working Space
5.	**1994 Q21 P1** The figure below shows two pulleys with centres A and B and of radii 10cm and 5cm respectively. S and R are contacts points of the belt with the pulleys. The distance between the centres of the two pulleys is 50cm, and SAB = 84.260. A belt is tied around the two pulleys as shown. Calculate the total length of the belt (8 marks) 	
6.	**1994 Q11 P2** In the figure below AB is a tangent to the circle centre O and radius 12cm. The area of the triangle AOB is 120cm^2. OXB is a straight line.  Calculate XB (4 marks)	

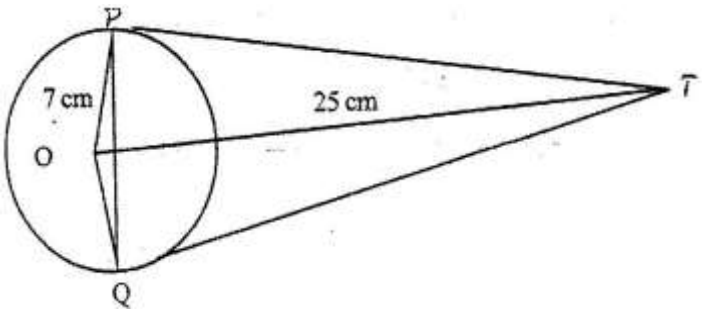
		Working Space
7.	**1995 Q 19** (a) In the figure below O is the centre of a circle whose radius is 5 cm. AB = 8 cm and < AOB is obtuse.  Calculate the area of the major segment (6 marks) (b) A wheel rotates at 300 revolutions per minute. Calculate the angle in radians through which a point on the wheel turns in one second.	
8.	**1997 Q 5 P2** The figure below represents a circle a diameter 28 cm with a sector subtending an angle of 75^0 at the centre.  Find the area of the shaded segment to 4 significant figures	

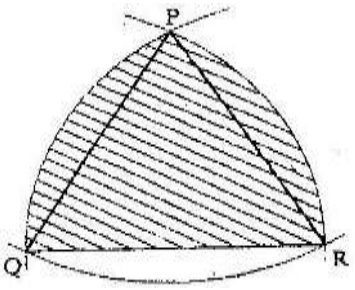
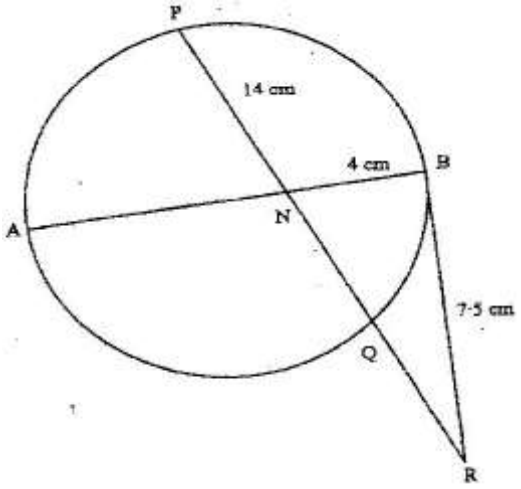
		Working Space
9	**1998 Q 23 P2** The figure below represents a rectangle PQRS inscribed in a circle centre O and radius 17cm. PQ = 16cm.  Calculate (a) The length PS of the rectangle (2 marks) (b) The angle POS (2 marks) (c) The area of the shaded region (4 marks)	

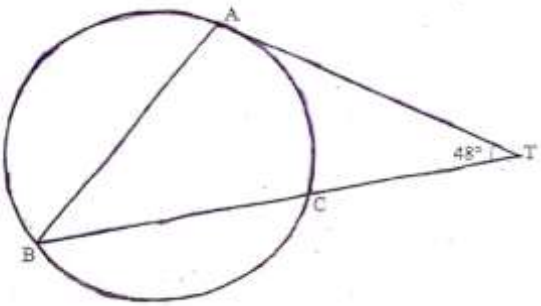
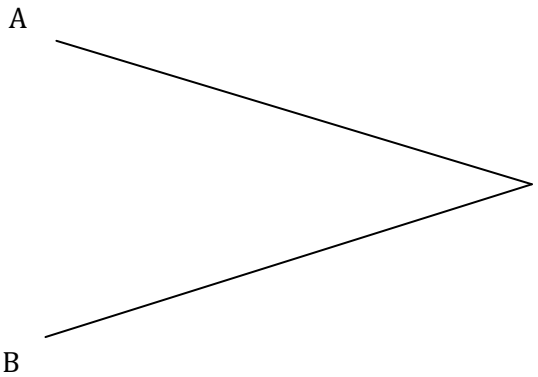
		Working Space
10	**2000 Q 14 P2** In the figure below, BT is a tangent to the circle at B. AXCT and BXD are straight lines AX = 6cm, CT = 8cm, BX = 4.8 cm and XD = 5cm. Find the length of (a) XC (b) BT  	
11	**2002 Q 12 P1** Chords XY and PQ of a circle intersect at a point M inside the circle. Given that MX = 8cm, XY = 14cm and MP = 4cm, calculate the length of MQ. (2 marks) .	

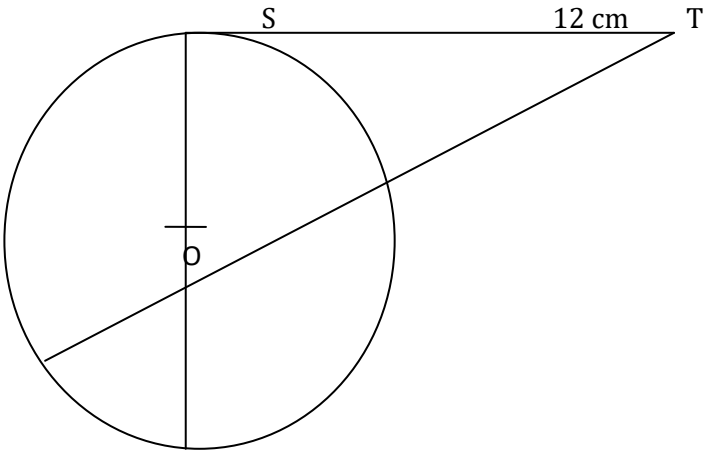
		Working Space
12	**2002 Q 23 P1** A minor sector of a circle of radius 28cm includes an angle of 135^0 at the center. a) (i) Convert 1350 into radians. Hence of otherwise find the area of the sector. ii) Find the length of the minor arc. b) The sector is folded to form a right circular cone. Calculate the : i) Radius of the cone ii) Height of the cone. (Take the value of Π to be $^{22}/_{7}$) (8 marks)	

		Working Space
13	**2003 Q 19 P1** The figure below shows two circles each of radius 7cm, with centers at X and Y. The circles touch each other at point Q.  Given that AXD = BYC = 1200 and lines AB, XQY and DC are parallel, Calculate the area of: a) Minor sector XAQD (Take $\Pi\ ^{22}/_{7}$) b) The shaded regions. (8 marks)	

		Working Space
14	**2004 Q 14 P1** The figure below shows a circle, centre, O of radius 7cm. TP and TQ are tangents to the circle at points P and Q respectively. OT =25cm.  Calculate the length of the chord PQ (3 marks)	
15	**2005 Q 6 P1** A point R divides a line PQ internally in the ration 3:4. Another point S, divides the line PR externally in the ratio 5:2. Given that PQ = 8cm, calculate the length of RS, correct to 2 decimal places. (3 marks)	

		Working Space
16	**2007 Q 14 P1** In the figure below, PQR is an equilateral triangle of side 6 cm. Arcs QR, PR and PQ arcs of circles with centers at P, Q and R respectively.  Calculate the area of the shaded region to 4 significant figures (4 marks)	
17	**2007 Q 11 P2** In the figure below AB is a diameter of the circle. Chord PQ intersects AB at N. A tangent to the circle at B meets PQ produced at R.  Given that PN = 14cm, NB = 4 cm and BR = 7.5 cm, calculate the length of: (a) NR (1 mark) (b) AN (3 marks)	

		Working Space
18	**2009 Q 15 P2** In the figure below, AT is a tangent to the circle at A. Angle ATB = 48°, BC = 5cm and CT = 4cm  Calculate the length of AT (2 marks)	
19	**2011 Q 10 P2** (a) In the figure below, lines NA and NB represent tangents to a circle at points A and B. Use a pair of compasses and ruler only to construct the circle. (2 marks)  (b) Measure the radius of the circle. (1 mark)	

		Working Space
20	**2012 Q14 P2** In the figure below, the tangent ST meets chord VU produced at T. Chord SW passes through the centre, O, of the circle and intersects chord VU at X. Line ST =12cm and UT =8cm.  (a) Calculate the length of chord VU. (2 marks) (b) If WX = 3cm and VX: XU = 2:3, find SX. (2 marks)	