

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2010 ACADEMIC YEAR

FOR THE CERTIFICATE OF BRIDGING MATHEMATICS

COURSE CODE: BMATH 001

COURSE TITLE: GEOMETRY AND VECTORS

STREAM: BRIDGING MATHEMATICS

DAY: FRIDAY

TIME: 9.00 – 11.00 A.M.

DATE: 30/07/2010

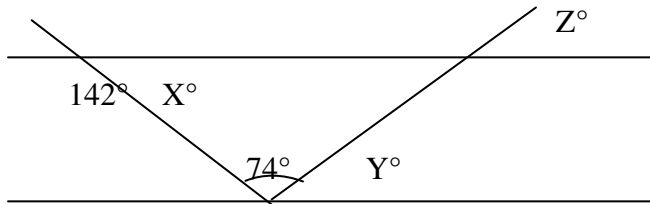
INSTRUCTIONS:

- Answer Question **ONE** and Any Other **TWO** Questions

PLEASE TURN OVER

QUESTION 1(30 MARKS)

- a) Define the term angle and state five types of angles [3mks]
- b) Find the size of an angle if it's five times its supplement [2mks]
- c) Find the value of x, y, z in the figure below. [3mks]



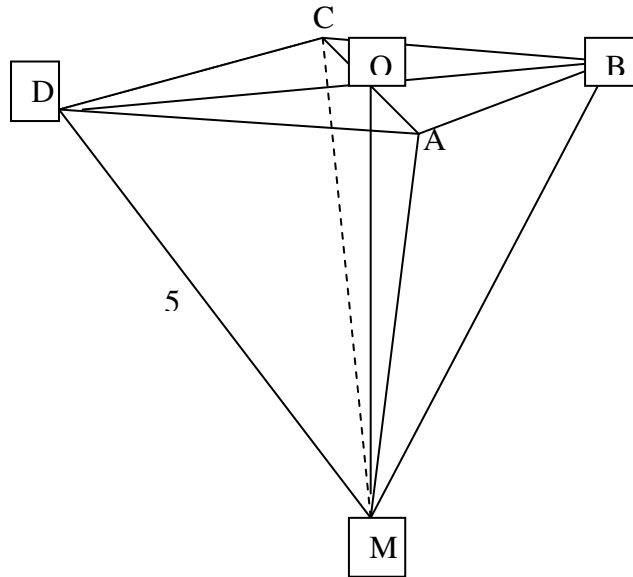
- d) What do you call a regular polygon each of whose interior angle is 60° and 90° ? State the name of each. [3mks]
- e) Find the number of sides of a polygon each of whose exterior angle is 36° and 60° .State the name of each. [3mks]
- f) Construct a regular pentagon of sides 4cm. [3mks]
- g) Triangle RST is such that angle $RST=53^\circ$, $ST=10\text{cm}$, $TR=8\text{cm}$.Construct the triangle and measure RS and angle TRS. [3mks]
- h) AB is the diameter of a circle such that the coordinate of A (1,1) ,B(5 ,1) respectively. Find the centre and the radius of the circle hence state the equation of the circle. [4mks]
- i) The equation of a circle is $x^2-6x+y^2+4y=3$.Find the centre and radius. [3mks]
- j) Find the area of a sector of a circle if $r=1.4\text{cm}$ and angle is 30° [3mks]

QUESTION 2 (20 MARKS)

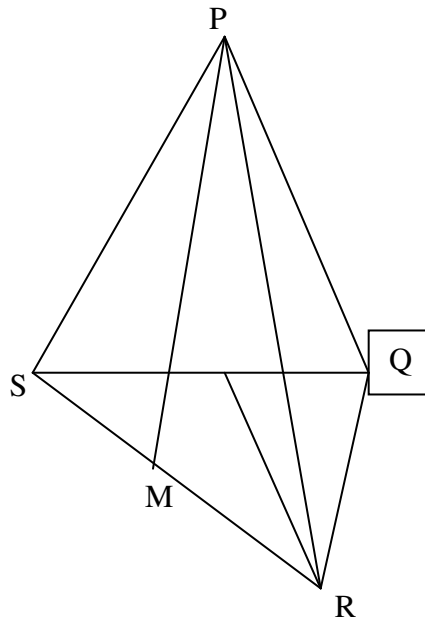
- a) Two circles have radii 4cm and 8cm respectively. If they share a common chord of length 6cm.Calculate the area of intersection of the two circles. [5mks]
- b) A minor sector of a circle of radius 28cm includes an angle of 135° at the centre .Find the area of the sector; the length of the minor arc, the sector is folded to form a right circular cone. Find the radius of the cone and height of the cone. [8mks]
- c) P and Q are the center of two circles with radii r_1 and r_2 .Construct the transverse common tangents to both sides. [7mks]

QUESTION 3 (20marks)

- 1) a) Consider the right pyramid below. Find the height of the pyramid, the slant height VM. If angle $\theta = 90^\circ$ AO is half the diagonal of the base rectangle ABCD and triangle VBC is an isosceles triangle. [9mks]



- b) Consider the regular tetrahedron of side 4cm and midpoint M of RS:



- i. Show that PM is $2\sqrt{3}$ long and that triangle PMQ is isosceles [3mks]
- ii. Calculate the angle between planes PSR and QRS [2mks]
- iii. Calculate the angle between line PQ and plane QRS [2mks]



c) Define the following:

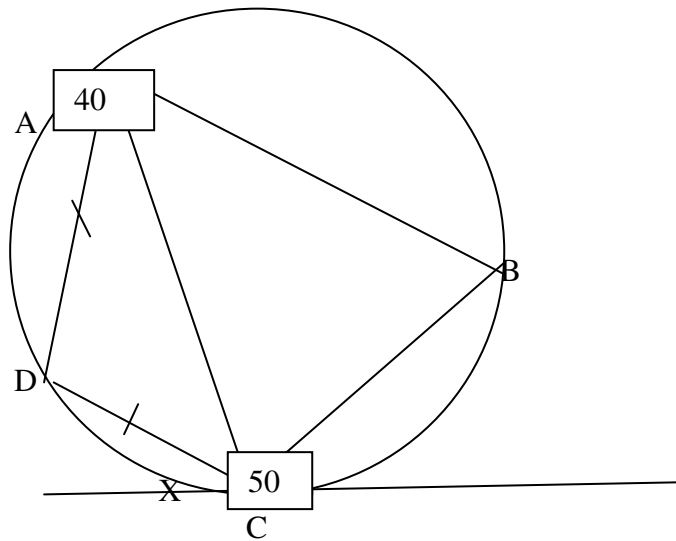
- i. Chord
- ii. Segment
- iii. Arc
- iv. Skew lines

[4mks]

QUESTION 4 (20MARKS)

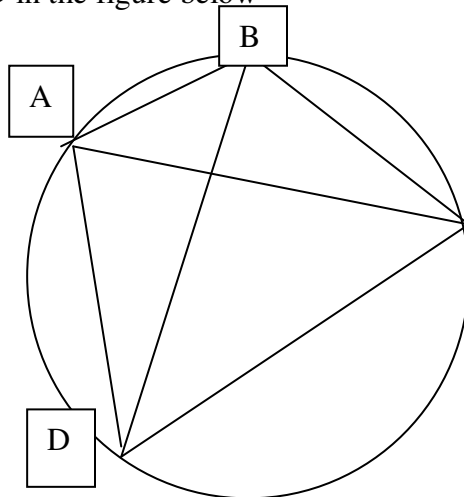
a) Find the values of x and y in the figure below:

[2mks]



b) Given that angle CDX=66° and angle ADT=62° and angle BAC=22°. Find angles ABD, ACD and angle BCD in the figure below

[5mks]



c) Construct a triangle PQR where PQ=8cm, angle RPQ=45° and angle PQR=60°. Using a ruler and a pair of compasses only and inscribe a circle and measure its radius

[5mks]

d) OAB is a triangle in which OA =a OB=b and C divides B in the ratio 3:2 and divides OB in the ratio 1:2. OC meets AD at S. Given that OS=n OC and AS= m AD. Express OS in terms of a and b and hence find the values of m, n, OS N and AS?

[8mks]

QUESTION 5 (20 MARKS)

- a) From a point P from the ground 15M away from the foot of a building the angle of elevation of the top of the building is 20° . Calculate the height of the building and the shortest distance of the top of the building from P. [5mks]
- b) Prove that $a/\sin A=b/\sin B=c/\sin C$ using sine rule [4mks]
- c) Solve for the lengths of the triangle .If $AC=6\text{cm}$, $BC=14\text{cm}$, if angle $A=62^\circ$, angle $B=58^\circ$, angle $C=68^\circ$ [3mks]
- d) Find the size of the smallest angle in the triangle below if $AC=5\text{cm}$, $AB=6.5\text{cm}$, $CB=3.5\text{cm}$ [3 mks]
- e) A chord XY of length 12cm is drawn in a circle centre O, radius 10cm with midpoint M. Calculate the distance ON, area of triangle OXY, area of sector OXY, area of minor and major segment [5mks]