

NAME: ADM NO:CLASS:
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**FORM TWO MATHEMATICS END OF TERM 3 EXAMS – 2019 TIME:
2 HOURS**

Attempt all the questions in the spaces provided.

1. Two spheres have surface areas of 36cm^2 and 49cm^2 . If the volume of the smaller sphere is 20.2cm^3
calculate the volume of the larger one. (3 mks)

2. Using mathematical tables, evaluate: (4 mks)

$$\frac{5467 \times 0.3278}{\sqrt[5]{0.0894}}$$

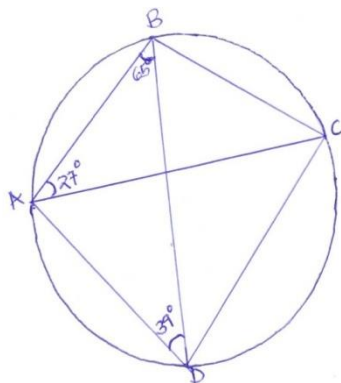
3. Simplify the expression below (3 mks)

$$\frac{6b + 2ab - 3a - a^2}{3a + 2ab - 6b - a^2}$$

4. If $4^{3y-4x} = 64$ and $3^y \div 9^x = 1$, solve for x and Y. (3 mks)

5. A straight line passes through point B(-2,1) and C(6,3). Find the equation of a line parallel to BC and passes through a point D(2,4). (3 mks)

6. In the figure below, angle CAB = 27° , angle ABD = 65° and angle DB = 39° . Find the size of angle CBD. (3 mks)



7. Common salt has a density of 2.2g/cm^3 while sand has a density of 3.2g/cm^3 . If 0.8kg of salt is mixed with 1.5kg of sand, find the density of the mixture. (3 mks)

8. The volume of water in a measuring cylinder is 25.2cm^3 . After a solid metal sphere is immersed into it, the measuring cylinder reads 29.4cm^3 . Calculate the radius of the sphere. (3 mks)

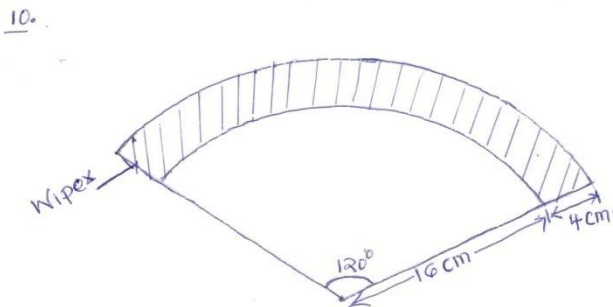
9. $\cos \theta = \frac{1}{\sqrt{3}}$ where θ is an acute angle. Without using mathematical tables, find;

(a) $\tan(90^\circ - \theta)$ (1 mk)

(b) $\sin \theta$ in the form $\frac{\sqrt{a}}{\sqrt{b}}$ where a and b are integers. (2 mks)

10. The shaded region in the figure below shows the area swept out on a flat windscreen by a wiper.

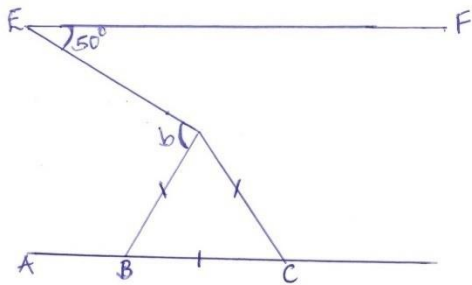
Calculate the area of this region. (3 mks)



11. A triangular flower garden measures 10m, 15m and 24m. Find the area of the garden.
(3 mks)

12. Triangle OAB is such that $OA = a$ and $OB = b$. C lies on OB such that $OC:CB = 1:1$. D lies on AB such that $AD:DB = 1:1$ and E lies on OA such that $OA:AE = 3:1$. Find CD in terms of a and b. (3 mks)

13. Giving reasons, find the angle marked b, given that EF is parallel to AC. (3 mks)



SECTION B: (30 MARKS)

Answer any three questions in this section.

14. The height (in cm) of some seedlings in a nursery are recorded in the table below.

Height (cm)	1.0 – 1.4	1.5 – 1.9	2.0 – 2.4	2.5 – 2.9
No. of seedlings	2	6	4	8

(a) State the median class (1 mk)

(b) Calculate the mean height of the seedlings in the nursery. (4 mks)

(c) On the grid provided, draw a histogram and a frequency polygon to represent the information.

(5 mks)

15. On the graph paper provided, plot the triangle whose co-ordinates are A(1, 3) B(2, 1) and C(3, 4). (1 mk)

(a) On the same grid, draw;

(i) A'B'C' the image of ABC under an enlargement, centre (0,0), scale factor -1 and state its co-ordinates. (3 mks)

(ii) A''B''C'' the image of A'B'C' under a rotation of $+90^\circ$ about origin. State the co-ordinates of A''B''C''. (3 mks)

(iii) $A''B''C''$ the image of $A'B'C'$ under reflection in the line $Y=x$ and state its coordinates (3 mks)

16. Three warships P, Q and R leave port X at 9.00 a.m. Ship P sails at a steady speed on a bearing of 070° , 100km from port X while ship Q sails on a bearing of 320° , 80km from port X. Ship R is on a bearing of 150° from port X and due south of ship P.

(a) Construct a scale drawing to show the position of P, Q, R and X. (4 mks)

(b) Use the scale drawing to determine:

(i) The distance and bearing of ship P from ship Q. (2 mks)

(ii) The distance of ship R from port X. (2 mks)

(iii) The distance of ship R from ship P.

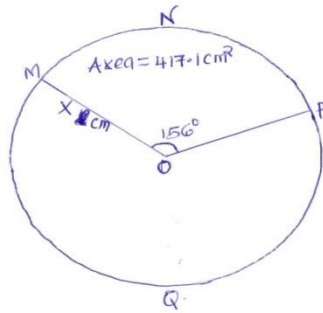
(2 mks)

17. (a) Use a ruler and a pair of compasses only to construct triangle ABC such that $AB = 2.5\text{cm}$, $BC = 3.5\text{cm}$ and $AC = 5.5\text{cm}$. Measure $\angle ABC$. (3 mks)

(b) Drop a perpendicular from A to a point T on CB produced. Measure the length AT . (3 mks)

(c) With BT as the base, calculate the area of triangle ABT and triangle ACT. (4 mks)

18. The circle in figure below has a radius Xcm and centre O. Minor arc MNP subtends an angle of 156° at the centre of the circle. Sector MNP has an area of 417.1cm^2



(a) Taking $\pi = \frac{22}{7}$, find x.

(3 mks)

(b) The major sector MQP is obtained from the circle and folded into a cone. Find:

(i) The radius of the cone's base. (2 mks)

(ii) The height of the cone. (3 mks)

(iii) The surface area of the cone. (2 mks)