

FOCUS A365

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FORM 3 TERM 1 MATHEMATICS PP2 EXAMINATIONS 2018

NAME: _____ ADM NO: _____ CLASS: _____

INSTRUCTION TO STUDENTS:

1. Write your **name**, **admission number** and **class** in the spaces provided above.
2. Write the **date** of examination in spaces provided.
3. This paper consists of **two** Sections; Section **I** and Section **II**.
4. Answer **ALL** the questions in Section **I** and only **five** questions from Section **II**.
5. All answers and working must be written on the question paper in the spaces provided below each question.
6. Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.
7. Marks may be given for correct working even if the answer is wrong.
8. KNEC Mathematical tables **may be** used, except where stated otherwise.
9. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
10. Candidates should answer the questions in English.

FOR EXAMINER'S USE ONLY:

SECTION I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL

17	18	19	20	21	22	23	24	TOTAL

TOTAL

SECTION
II
G
RAND

Ensure that all the pages are printed and no question(s) are missing

Questions

1. Use logarithms correct to 4 decimal places, to evaluate. (4 marks)

$$\frac{\sqrt[3]{83.46 \times 0.0054}}{1.56^2}$$

2. Form the quadratic equation whose roots are $X = \frac{5}{3}$ and $X = 1$. (2mks)

3. Simplify

$$\frac{4x^2 - 16y^2}{6x^2 - 8xy - 8y^2}$$

$$6x^2 - 8xy - 8y^2$$

3mks

4. Simplify $\frac{4}{\sqrt{5} + \sqrt{2}} - \frac{3}{\sqrt{5} - \sqrt{2}}$

3mks

5. Solve for x given that ;

$$\log_{10}^{(x-1)} + 1 = \log_{10}^{(x-4)}$$

3mks

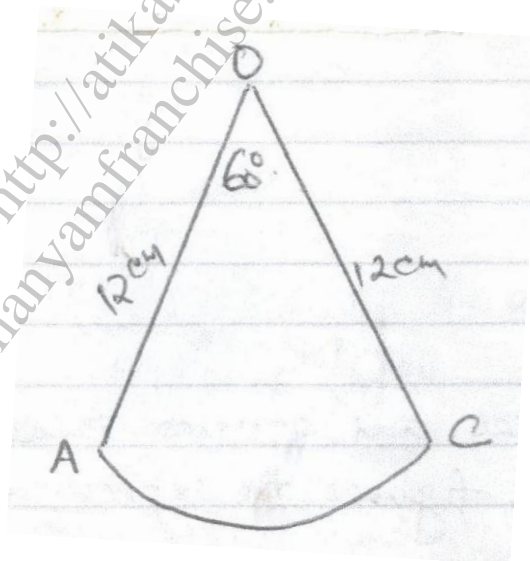
6. A farmer has a piece of land measuring 840 m and 396 m. He divides it into square plots of equal sizes. Find the maximum area of one plot. 3mks

7. Find the percentage error in the total length of four rods measuring 12.5cm, 24.5cm, 12.9cm and 10.1cm all to the nearest 0.1cm. 3mks

8. The angle of elevation of the top of a cliff from point P is 45° . From point Q which is 10m from P towards the foot of the cliff, the angle of elevation is 48° . Calculate the height of the cliff. 4mks

9. Given that 3θ is an acute angle and $\sin 3\theta = \cos 2\theta$, find the value of θ . (3 mks)

10. The sector below has a radius of 12cm and an angle $\text{AOC} = 60^\circ$ is folded to form a cone. Find the volume of the cone formed. (4 marks)



11. Sixteen men working 9 hours a day can complete a piece of work in 14 days. How many more men working 7 hours a day would complete the same job in 12 days. 3mks

12. Three numbers have HCF of 15 and LCM of 540. Two of the numbers are 135 and 60 . Express the HCF and LCM in their prime powers and use the expressions to determine all possible values of the third. 4mks

13. A square of side $(x+2)$ has the same area as rectangle measuring $(2x + 4)$ cm and $(x-2)$ cm. - Calculate the area of the rectangle. 3mks

14. The marked price of a pair of shoes is sh.2400.a customer buys the shoes and is offered a 10% discount and the seller still makes a profit of 20% on the cost of the shoes. Determine the cost price. 3mks

15. A square brass plate is 2 mm thick and has a mass of 1.05 kg. The density of the brass is 8.4 g/cm³. Calculate the length of the plate in centimeters (3 marks)

16. Use calculator to evaluate.

(2mks)

$$\sqrt[3]{675 \times 135}$$

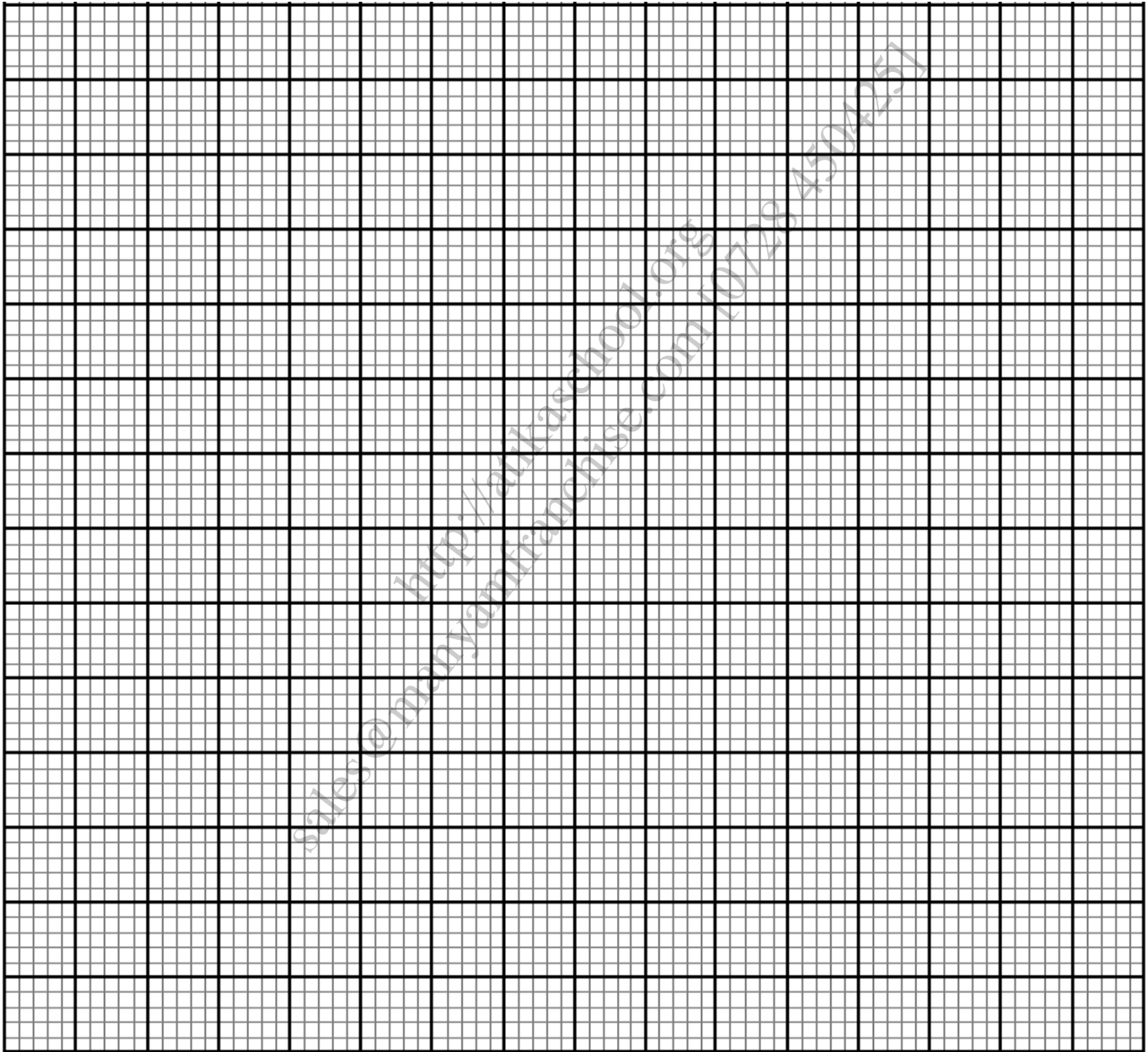
$$\sqrt{2025}$$

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SECTION II 50 MKS

17. The vertices of a triangle ABC are (6,1), B(6,3) and C(10,1). The image of this triangle under a certain rotation is $A^1 B^1 C^1$ and has the vertices at A^1 (2,5) and B^1 (0,5) and C^1 (2,9).

a. On the grid provided, plot triangles ABC and $A^1 B^1 C^1$. 2mks



b. Find
i. The centre of rotation.

2mks

- ii. The angle of rotation. 2mks
- c. $A^{\text{II}} B^{\text{II}} C^{\text{II}}$ is the image of $A^{\text{I}} B^{\text{I}} C^{\text{I}}$ under a reflection in the line $y=-x$. On the same grid;
- i. Draw the image of $A^{\text{II}} B^{\text{II}} C^{\text{II}}$. 3mks
- ii. Find the co-ordinates of $A^{\text{II}} B^{\text{II}} C^{\text{II}}$. 1mk

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18. A business lady bought 100 quails and 80 rabbits for sh 25,000. If she had bought twice as many rabbits and has as many quails she would have paid sh.7,400 less. She sold each quail at a profit of 10% and each rabbit at a profit of 20%.

a. Form two equations to show how much she bought the quails and the rabbit. 2mks

b. Find the cost of each. 3mks

c. Calculate the profit she made from the sale of the 100 quails and 80 rabbits. 3mks

d. What percentage profit did she make from the sale of the quails and 80 rabbits. 2mks

19. P, Q and R are three villages such that $PQ = 10\text{km}$, $QR = 8\text{km}$ and $PR = 4\text{km}$ where PQ, QR and PR are connecting roads.

a. Using a scale of 1cm rep 1km, locate the relative positions of the three villages. 2mks

b. A water tank T is to be located at a point equidistant from the three villages. By construction, locate the water tank T and measure its distance from R. 3mks

c. Determine the shortest distance from T to the road PQ by construction. 2mks

d. Determine the area enclosed by PQ, QR and PR by calculation. 3mks

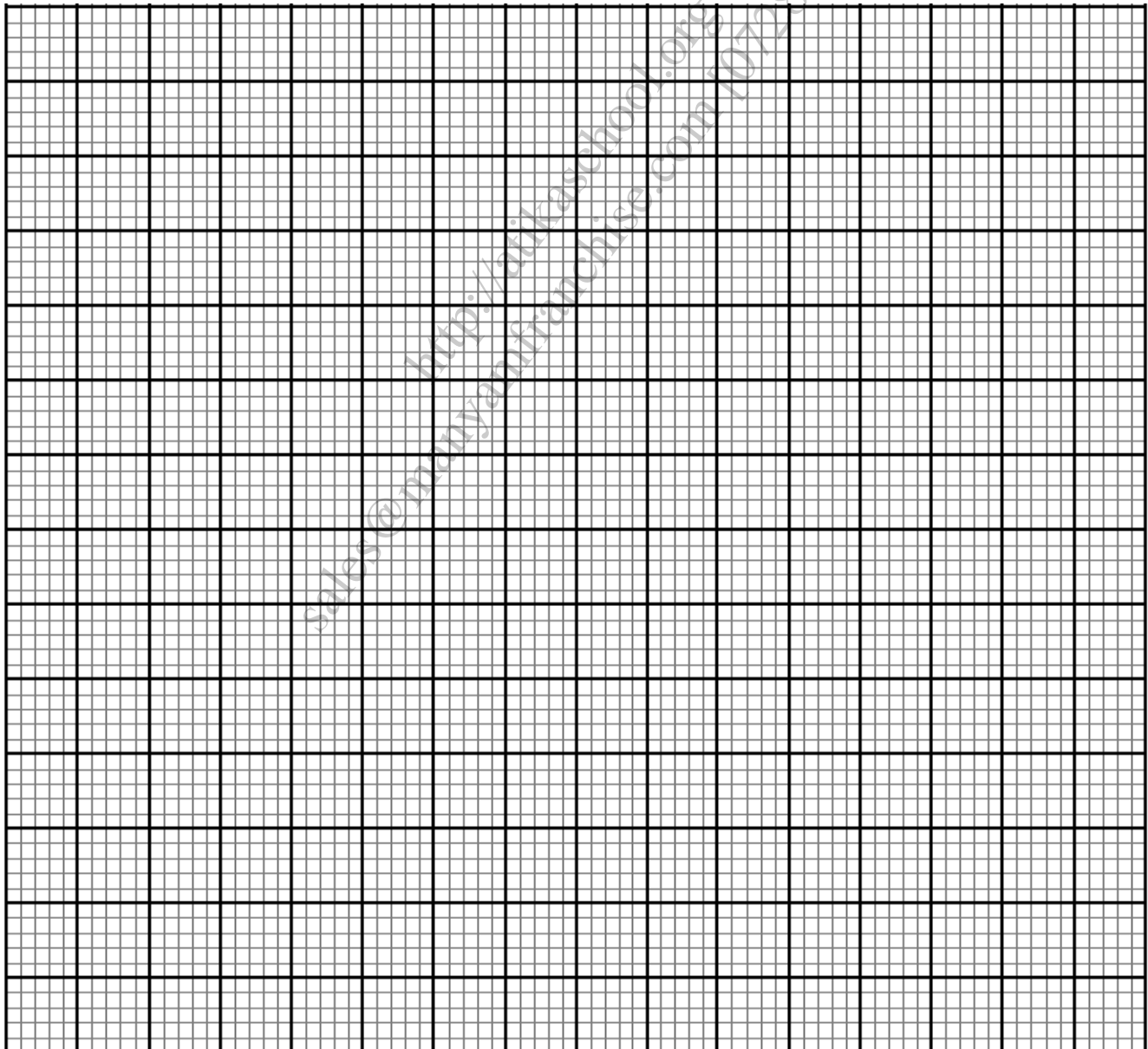
20. a) Copy and complete the following table for $y = 2x^2 + 4x - 5$

2mks

x	-4	-3	-2	-1	0	1	2
$2x^2$				-2			8
$4x$				-4			8
-5	-5	-5	-5	-5	-5	-5	-5
y				-7	-5		11

b) (i) on the grid provided Draw the graph of $y = 2x^2 + 4x - 5$

3mks



(ii) Use the graph of b (i) above to solve the equations $2x^2 + 4x - 5 = 0$

1mk

c) To solve the equation $2x^2 + x - 7 = 0$, a straight line must be drawn to intersect the curve $y = 2x^2 + 4x - 5$

i. Find the equation of the line.

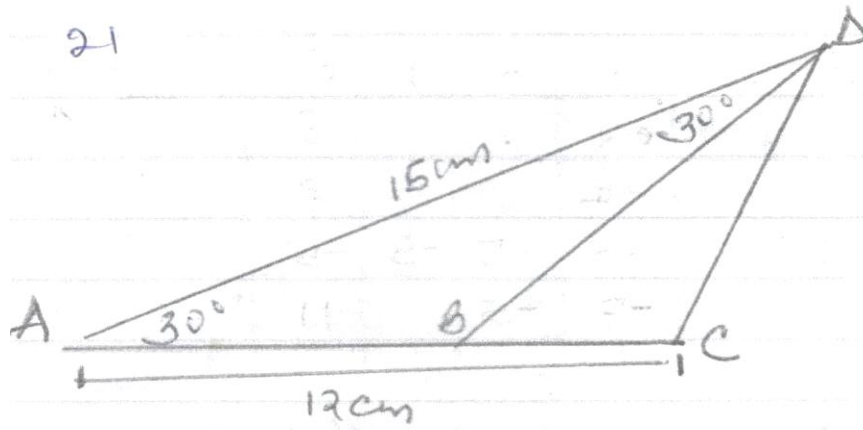
1mk

ii. Draw the line and hence estimate the roots of the equation $2x^2 + x - 7 = 0$

3mks

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21. In the figure below $AC=12\text{cm}$, $AD = 5\text{cm}$ and B is a point on AC $\angle BAD = \angle ADB$.



Calculate, correct to one decimal place.

a. The length of CD

3mks

b. The length AB

3mks

c. The area of triangle BCD

2mks

d. The size of $\angle BDC$

2mks

22. A number of people working at a factory decided to raise sh.72,000 towards a famine relief. Each person was to contribute the same amount .Before the contributions were collected five of the people retired from working at the factory.

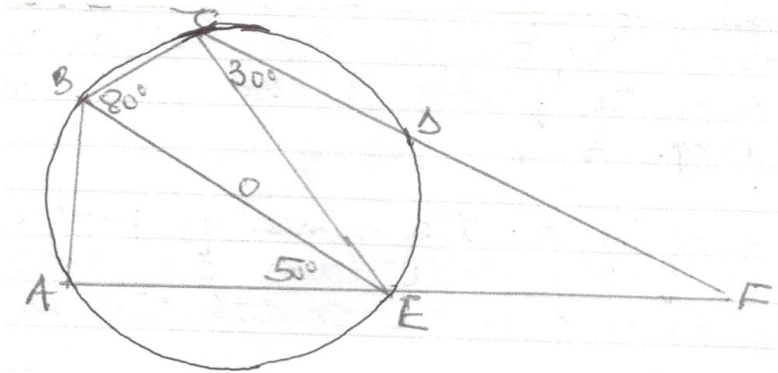
a. Taking 'n' as the number of people working in the factory, write down an expression for the increase in the contribution per person. 3mks

b. If the increase in the contribution per person was sh.1,200, find the number of people originally. 4mks

c. How much would each person have contributed to the nearest shillings for the five had not retired. 1mk

d. Calculate the percentage increase in the contribution per person caused by retirements giving your answer to the nearest hundredth. 2mks

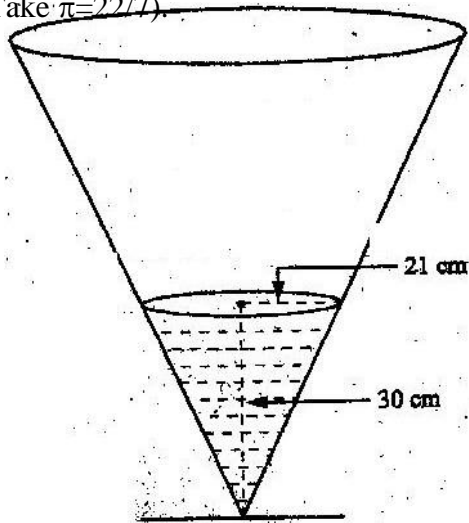
23. In figure below, O is the centre of the circle, Angle AEB = 50°, angle EBC = 80° and angle ECD = 30°



Giving reasons, calculate.

- | | | |
|------|------------------|------|
| i. | Angle CDE | 3mks |
| ii. | Angle DFE | 2mks |
| iii. | Obtuse angle CDE | 2mks |
| iv. | Angle ADE | 2mks |

24. The diagram below represents a conical vessel which stands vertically. The vessel stands vertically. The vessel contains water to a depth of 30cm. The radius of the surface in the vessel is 21cm. (Take $\pi = \frac{22}{7}$).



- a) Calculate the volume of the water in the vessels in cm^3 2mks
- b) When a metal sphere is completely submerged in the water, the level of the water in the vessels rises by 6cm.
- Calculate:
- (i) The radius of the new water surface in the vessel; (2mks)
- (ii) The volume of the metal sphere in cm^3 (3mks)
- (iii) The radius of the sphere. (3mks)

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