

ADM: \_\_\_\_\_ NAME: \_\_\_\_\_

CANDIDATE'S SIGN: \_\_\_\_\_ DATE: \_\_\_\_\_ CLASS: \_\_\_\_\_

# FOCUS A365

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## St. Clare Girls H. SCHOOL - Gatitu

Form 3

Term 2

121 A - Mathematics

14-Jun-18

Mid Term

### INSTRUCTIONS:

1. Write your name, class and ADM number in the spaces provided above.
2. All workings must be clearly shown
3. Answer all questions in section A and any other four questions in section B

### For examiner's use only

<u>Candidate's Score</u>	<u>Max. Score</u>	<u>Teacher's Comment</u>
	<b>100</b>	

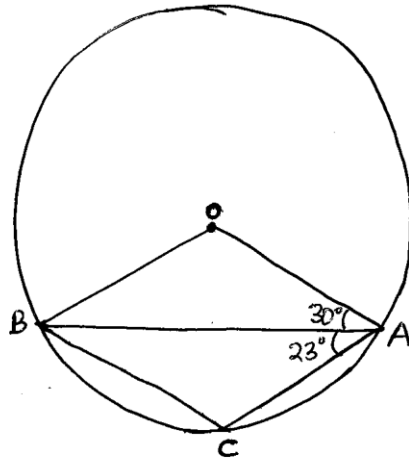
### SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION (60 marks)

1 Use logarithm tables to evaluate;

[4 Marks]

$$\sqrt[3]{\frac{146.34^2 \times 0.0063}{\cos 54}}$$

- 2 In the figure below, O is the centre of the circle. Angle OAB=30° and angle BAC = 23°. Find angle ABC. [3 Marks]



- 3 a A number n is such that when it is divided by 3,7,11 or 13, the remainder is always 1. Find the number. [2 Marks]

- b Otieno miscopied 98 as 89. He multiplied 89 by a certain number and got 4005. Find that number and the correct product. [2 Marks]

- 4 Evaluate using mathematical tables only expressing your answer to 4 significant figures. [3 Marks]

$$\frac{3}{0.2311} + (0.7918)^2$$

- 5 Given that:  
 $\sin(3x - 35) = \cos(x + 20)$ . Find  $x$  *[2 Marks]*
- 6 The size of an interior angle of a regular polygon is  $(3x)^\circ$  while the exterior angle is  $(x-20)^\circ$ . Find the number sides of the polygon *[3 Marks]*
- 7 Factorise  $2x^2 - x - 6$  hence find the roots of the quadratic equation;  
 $2x^2 - x - 6 = 0$  *[3 Marks]*
- 8 A body accelerates at  $5\text{m/s}^2$  to reach a velocity of  $60\text{m/s}$  in 5 seconds. Calculate the initial velocity. *[2 Marks]*

9 Draw a triangle STR and put arrows on its side to show that  $\overrightarrow{TS} + \overrightarrow{SR} = \overrightarrow{TR}$  [2 Marks]

10 a Evaluate without using a calculator; [3 Marks]

$$\frac{1\frac{1}{2} \times 4\frac{3}{5} - 1\frac{3}{5}}{3\frac{1}{5} + 7\frac{1}{2} \div 1\frac{1}{2}}$$

b Three similar steel bars of length 200cm, 300cm and 360cm are cut into equal pieces. [3 Marks]  
Find the largest possible area of a square that can be made from any of the three pieces.

c I have a packet of sweets. When I try to share them equally among 2,3,4,5 and 6 [3 Marks]  
children, I always have one left over. What is the minimum number of sweets that can be in the packet?

d Given that  $x = y$ ,  $y = 3$  and  $z = \frac{2x}{3y}$ , evaluate the value of  $\frac{x+y}{2z+3x}$  **[3 Marks]**

e A wooden block measuring 20cm by 30cm by 50cm has mass of 22.5kgs. Find the density of the wood in  $\text{g/cm}^3$ . **[3 Marks]**

11 Solve for  $x$  in **[3 Marks]**  
 $9^x + 3^{2x} = 54$

12 Find all the integral values of  $x$  which satisfy the following inequalities **[3 Marks]**  
 $2(2 - x) < 4x - 9 < x + 11$

- 13 Mary and John live 140km apart. Mary starts from her home at 7.00am and drives towards John's home at 80km/hr. John starts at 7.30am and drives towards Mary's home at 100km/hr. at what time did they meet? *[3 Marks]*

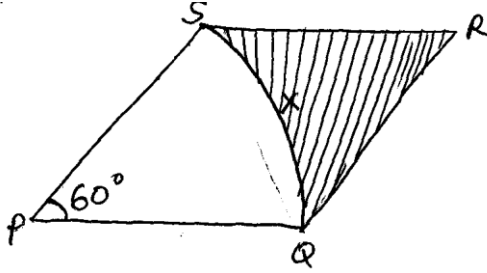
- 14 A Kenyan company received \$100,000 US dollars. The money was converted into Kenya shillings in a bank which buys and sells foreign currencies as follows;

	<b>Buying.</b>	<b>Selling</b>
1 US Dollar (\$)	77.23	78.11
1 Sterling Pound (£)	121.04	122.93

- a Calculate the amount of money, in Kenya shillings the company received *[2 Marks]*

- b The company exchanged the Kenya-shilling calculated in (a) above into sterling pounds to buy a car from Britain. Calculate the cost of the car to the nearest sterling pound. *[2 Marks]*

- 15 The figure below shows a rhombus PQRS with  $PQ=9\text{cm}$  and  $\angle SPQ=60^\circ$ , S×Q is a circular arc center P. [3 Marks]



Calculate the area of the shaded region correct to 2 decimal places.

- 16 The straight line joining the points  $P(a, 7)$  and  $Q(13, a)$  is parallel to the line whose equation is  $3y + 2x = 9$ . Find the value of a. [3 Marks]

**SECTION B: ANSWER ONLY FOUR QUESTIONS IN THIS SECTION (40 marks)**

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- 17 A salesman received a basic salary of sh. 50,000 a year together with a commission of 6% on the value of goods sold and a car allowance of sh. 2.50 per km.
- a Find the total amount he received in a year in which he sells goods worth sh. 625,000 and travels 10,000km. **[4 Marks]**

- b The next year he travels 12,000km and receives a total of sh. 134,000.
- i. Calculate the value of goods sold. **[4 Marks]**

- ii. Calculate the percentage increases in the value goods sold. **[2 Marks]**



- 18 The following measurements were recorded in a field book at a farm using  $XY = 400m$  as the baseline.

	Y	
C 60	340	
	300	120 D
	240	100 E
	200	160 F
B 100	140	
A 120	80	
	X	

- a Using the scale of 1: 4000 (1cm represents 40m) draw accurately the map of the farm.

**[4 Marks]**

b Determine the actual area of the farm in hectares.

*[4 Marks]*

c If the farm is on sale at Ksh. 80,000 per hectare, how much does the farm cost?

*[2 Marks]*

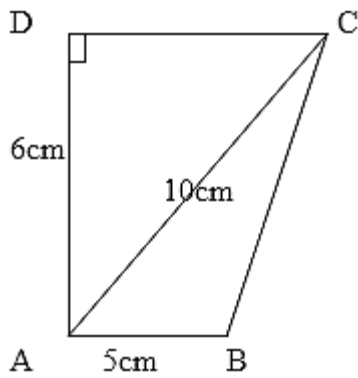
19 a Construct a triangle XYZ such that  $XY=7.5\text{cm}$ .  $\angle ZXY = 63^\circ$  and  $\angle ZYX= 58^\circ$ . *[3 Marks]*

b Measure line XZ *[1 Mark]*

c Drop a perpendicular from Z to touch line XY at K. Measure ZK *[3 Marks]*

d Calculate the area of  $\Delta XYZ$  *[3 Marks]*

20 A Use the figure below to answer the questions that follow.



Find:

i. The area of triangle ABC

[2 Marks]

ii. The length of the perpendicular from B to AC

[2 Marks]

B PQRS is a trapezium with area  $88.2\text{cm}^2$ . PQ is parallel to RS. If  $PQ=9.4\text{cm}$  and the distance between PQ and RS is  $6.3\text{cm}$ . Find the length of RS.

[3 Marks]

C The diagonals of a rhombus measure  $16\text{cm}$  by  $12\text{cm}$ . Calculate the area of the rhombus.

[3 Marks]

21 The marks of 30 girls in a class were recorded as follows.

220 250 204 230 210 227 221 252  
200 228 208 225 200 202 240 228  
212 225 252 216 212 226 227  
240 248 203 201 251 242 216

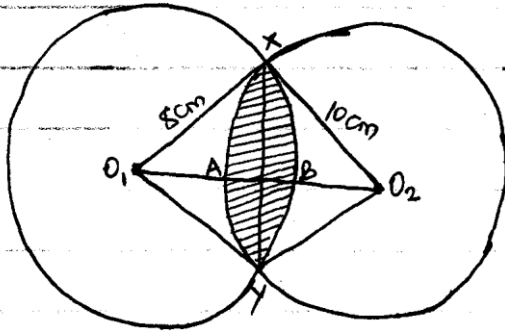
A Construct a frequency table with a class width of 5 Marks beginning with 199 marks. *[3 Marks]*

B What is the modal class? *[1 Mark]*

C Estimate the mean *[3 Marks]*

D Estimate the median *[3 Marks]*

- 22 The diagram below shows two circles that share a common chord XY which is 13cm long. Calculate;



- A  $\angle XO_1Y$  [1 Mark]
- B  $\angle XO_2Y$  [1 Mark]
- c The area of the sector  $O_1XBY$  [2 Marks]
- d The area of the sector  $O_2YAX$  [2 Marks]
- e The area of the shaded part [4 Marks]