

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

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

# FOCUS A365

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## St. Clare Girls H. SCHOOL - Gatitu

Form 2

Term 2

121 A - Mathematics

08-Jun-18

Mid Term

### INSTRUCTIONS:

1. Write your name, class and ADM number in the spaces provided above.
2. Answer all the questions provided in this question paper
3. All workings must be clearly shown
4. Any acts of cheating will render your examinations nullified
5. Confirm that this paper has 15 printed pages with 100 marks

### 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 Mks]

$$\sqrt{\left(\frac{2.935 \times 0.0765}{32.74}\right)}$$

2 Write the following in index notation:

i.  $\log_m w = n$

[1 Mk]

ii.  $\log_{10} 9 = x$

[1 Mk]

3 Write the following in logarithmic notation:

i.  $m^b = 3$

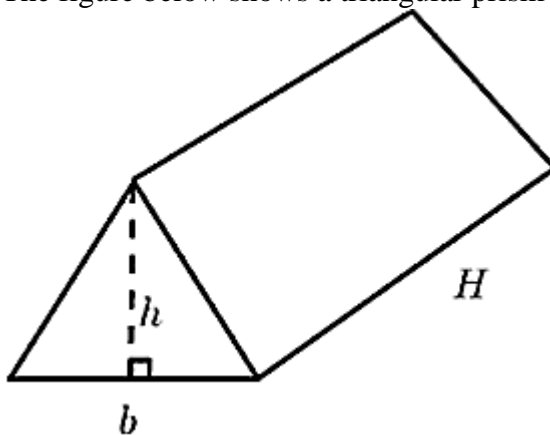
[1 Mk]

ii.  $2^4 = 16$

[1 Mk]

4 The figure below shows a triangular prism ABCDEF. Draw its net.

[2 Mks]



- 5 Interior angles of a pentagon are  $2x^\circ$ ,  $\frac{1}{2}x^\circ$ ,  $110^\circ$ ,  $130^\circ$  and  $160^\circ$ . Find the value of the smallest angle. **[3 mks]**

- 6 a Simplify: **[3 mks]**
- $$\frac{2\frac{1}{2} + \frac{2}{3} \text{ of } 3\frac{3}{4} - 4\frac{1}{6}}{1\frac{1}{4} - 2\frac{2}{5} \div 1\frac{1}{3} + 3\frac{3}{4}}$$

- b Simplify: **[3 mks]**
- $$\frac{22-14}{6x-2} - \frac{4^2x-6-12}{72 \div -8 \times 3}$$

c Solve for x in the equation:

[3 mks]

$$\frac{x-1}{x} - \frac{2x+1}{3x} = \frac{2}{3}$$

7 A Kenyan company received US dollars 100,000. The money was converted into Kenyan shilling in a bank which buys and sells foreign currencies as follows.

	Buy	sell
1 US Dollar	77.24	77.44
1 sterling pound	121.93	122.27

a Calculate the amount of honey in Kenyan shillings the company received.

[2 mks]

b The amount above was converted to sterling pounds. Calculate the amount in sterling pounds.

[1 mk]

- 8 Solve the following equations. *[3 mks]*
- $$\begin{aligned}2x+5y &= 19 \\4x + y &= 23\end{aligned}$$

- 9 Without using mathematical tables or a calculator, evaluate. *[3 mks]*
- $$\sqrt{\frac{0.0625 \times 2.56}{0.25 \times 0.08 \times 0.5}}$$

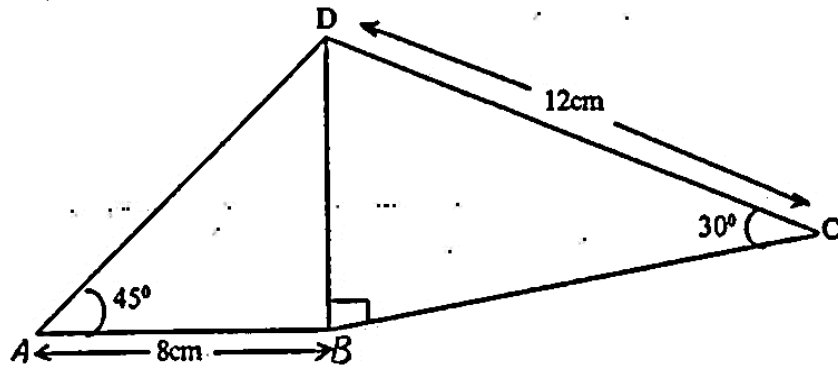
- 10 Use reciprocal tables to evaluate: *[3 mks]*
- $$\frac{3}{14.56} + \frac{9}{0.456}$$

- 11 A shirt whose marked price is sh. 800 is sold to a customer after allowing him a discount of 13%. If the trader made a profit of 20%. Find the cost of the shirt. *[3 mks]*
- 12 Solve for x in the following equations: *[2 mks]*
- i  $(7^5)^x = (7^4) \div 7^2$
- ii  $\frac{81^{22} \times 27^x}{9^x} = 729$
- 13 Write the following numbers in standard form
- a 43.72 *[1 mk]*
- b 0.3529 *[1 mk]*

- 14 Find the gradient of a line that passes through the given points.
- a A (3,2) and B (-1,1) *[2 mks]*
- 
- 
- b k (0.5, 0.3) and L (-0.2, -0.7) *[2 mks]*
- 
- 
- c Calculate the coordinates where the two lines (a & b above) meet *[4 mks]*
- 
- 
- 
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- 15 Mogaka and Onduso together can do a piece of work in 6 days. Mogaka, working alone, takes 5 days longer than Onduso. How many days does it take Onduso to do the same work alone? *[3 mks]*

16

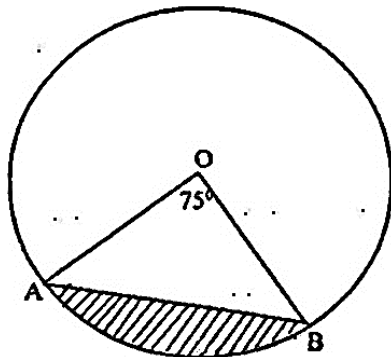
The figure below shows a quadrilateral ABCD in which  $AB = 8 \text{ cm}$ ,  $DC = 12 \text{ cm}$ ,  $\angle BAD = 45^\circ$ ,  $\angle CBD = 90^\circ$  and  $\angle BCD = 30^\circ$ .



Find:

- a The length of BD [2 mks]
  
- b The size of the angle ADB [2 mks]

- 17 The figure below represents a circle a diameter 28 cm with a sector subtending an angle of  $75^\circ$  at the centre. [4 mks]



Find the area of the shaded segment to 4 significant figures.



**SECTION B: ANSWER ONLY FOUR QUESTIONS IN THIS SECTION**

**(40 marks)**

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18 a Convert the following into fractions in the simplest form.

i. 0.375

*[1 mk]*

ii.  $1.\dot{3}$

*[1 mk]*

b Round of as indicated in brackets

i. 1.43216 (3d.p)

*[1 mk]*

ii. 40.0069 (3sf)

*[1 mk]*

iii. 63290 (2sf)

*[1 mk]*

iv. 19.99 (nearest whole number)

*[1 mk]*

c Without using a calculator or table convert into decimals to 4sf

i.  $\frac{89}{9}$

*[1 mk]*

ii.  $\frac{5}{6}$

*[1 mk]*

iii.  $16\frac{3}{8}$

*[1 mk]*

d Find the HCF of 24,36 and 56

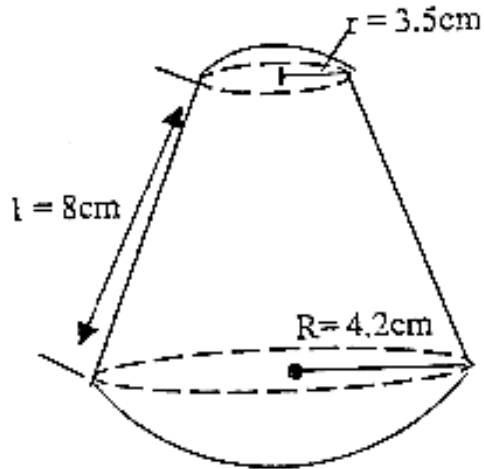
*[1 mk]*

- 19 A port B is on a bearing of  $080^\circ$  from a port A and at a distance of 95 km. A submarine is stationed at port D which is on a bearing of  $200^\circ$  from A, and at a distance of 124 km from B. A ship leaves B and moves directly southwards to an island P, which is on a bearing of  $140^\circ$  from A. The submarine at D on realizing that the ship was heading for the island P decides to head straight for the island to intercept the ship. Using a scale of 1 cm to represent 10 km, make a scale drawing showing the relative position of A, B, D and P. Hence find: *[6 mks]*

- i. The distance from A and D *[1 mk]*
- ii. The bearing of the submarine from the ship when the ship was setting off from B *[1 mk]*
- iii. The bearing of the island P from D *[1 mk]*
- iv. The distance the submarine had to cover to reach the island *[1 mk]*

20

A solid made up of a conical frustrum and a hemisphere top as shown in the figure below. The dimensions are as indicated in the figure.



a Find the area of:

i. The circular base

[2 mks]

ii. The curved surface of the frustrum

[2 mks]

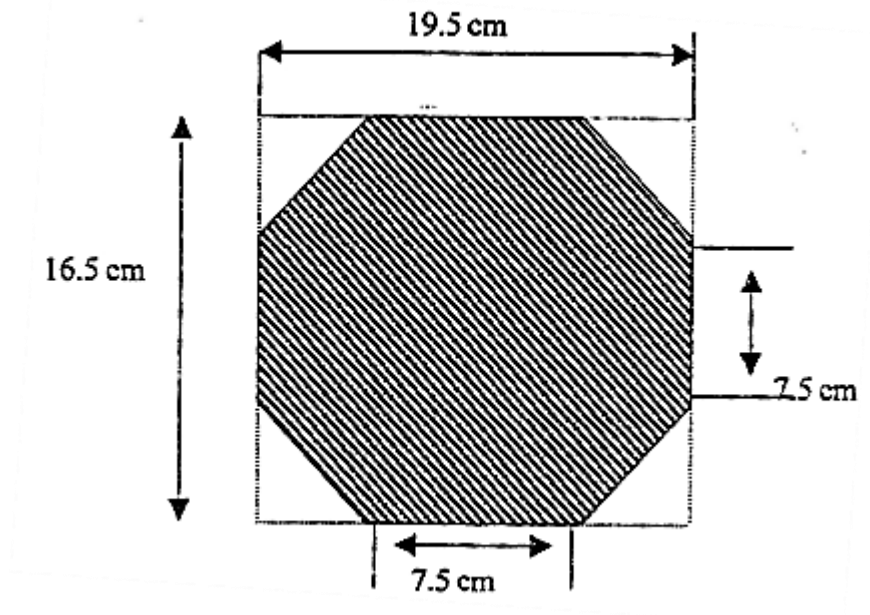
iii. The hemisphere surface

[2 mks]

b A similar solid has a total area of  $81.51\text{ cm}^2$ . Determine the radius of its base.

[4 mks]

- 21 a The figure below shows an octagon obtained by cutting off four congruent triangles from a rectangle measuring 19.5 by 16.5 cm [5 mks]



Calculate the area of the octagon

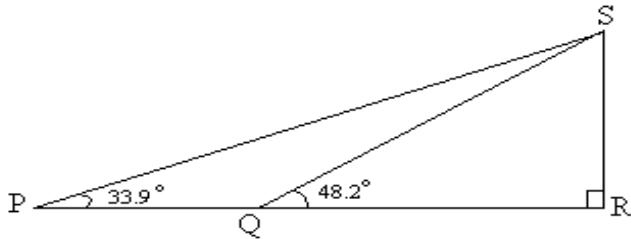
- b The length of a hollow cylindrical pipe is 6 metres. Its external diameter is 11cm and has a thickness of 1 cm. Calculate the, volume in  $\text{cm}^3$  of the materials used to make the pipe. Take  $\pi$  as 3.142 and give your answer to 1 d.p. [4 mks]

- c Solve the expression: [1 mk]  
 $(-7) + (-2) + (+6)$

- 22 a The masses in kilograms of 20 bags of maize were; 90, 94, 96, 98, 99, 102, 105, 91, 102, 99, 105, 94, 99, 90, 94, 99, 98, 96, 102, and 105.
- i. State the mode. *[2 mks]*
- ii. Calculate the mean mass per bag *[3 mks]*
- b A retailer bought 49 kg of grade 1 rice at Kshs. 65 per kilogram and 60 kg of grade II rice at Kshs 27.50 per kilogram. He mixed the two types of rice.
- i. Find the buying price of one kilogram of the mixture *[2 mks]*
- He packed the mixture into 2 kg packets
- ii. If he intends to make a 20% profit find the selling price per packet *[2 mks]*
- iii. Find the actual profit in shillings per kilogram of the mixture. *[1 mk]*

23

The diagram below shows vertical telephone pole RS supported by wires SP and SQ pegged at points P and Q respectively on a level ground. Points P and Q are on the same straight line from the base R of the pole. The angles of elevation of S from P and Q are  $33.9^\circ$  and  $48.2^\circ$  respectively.



Given that  $PR = 5$  m, calculate:

a The distance QR

[4 mks]

b The length of the wires SP and SQ

[4 mks]

c If the cost of the pole and labour is sh. 1600 and the cost of 1 meter of the wire is sh. 233. Find the total cost of the installation.

[2 mks]

**End of printed pages**