

SCAN

Candidate's Name: _____ Index No: _____

1301/311

1304/311

1305/311

MATHEMATICS

June/July 2015

Time: 3 hours

Candidate's Signature: _____

Date: _____



THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN MASONRY
CRAFT CERTIFICATE IN CARPENTRY
CRAFT CERTIFICATE IN PLUMBING

MATHEMATICS

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

You should have a Scientific calculator and Mathematical tables for this examination.

Answer any FIVE of the following EIGHT questions in the spaces provided.

ALL questions carry equal marks.

Maximum marks for each part of a question are as shown.

Do NOT remove any pages from this booklet.

Candidates should answer the questions in English.

For Examiner's Use Only

Question	1	2	3	4	5	6	7	8	TOTAL SCORE
Candidate's Score									

This paper consists of 16 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

1. The data below shows the marks scored by 40 students in a Mathematics examination:

52	61	59	75	69	55	77	81	88	80
66	65	67	72	81	71	78	83	85	65
46	54	69	75	83	86	89	74	82	57
84	72	70	84	49	58	73	80	70	62

- (a) make a frequency distribution table starting with 45-49, 50-54, ... (4 marks)
- (b) calculate the mean; (5 marks)
- (c) state the modal class; (1 marks)
- (d) calculate the median; (4 marks)
- (e) draw a histogram. (6 marks)
2. (a) Simplify:
- (i) $3^2 \times 81 + 9$; (2 marks)
- (ii) $\log_2 5 + 2\log_2 7 - 3$ (3 marks)
- (b) Solve:
- (i) $5^{x+2} = 7^{2x-3}$; (5 marks)
- (ii) $5^{2x} - 6 \times 5^x + 5 = 0$; (5 marks)
- (iii) $\log(x+5) = \log 4 - \log(x+4)$; (5 marks)
3. Draw the graph $y = 4x^2 - 4x - 3$ then use the graph to solve:
- (i) $4x^2 - 4x - 3 = 0$;
- (ii) $4x^2 - 4x - 5 = 0$;
- (iii) $4x^2 - 7x - 4 = 0$
- (20 marks)



4. (a)

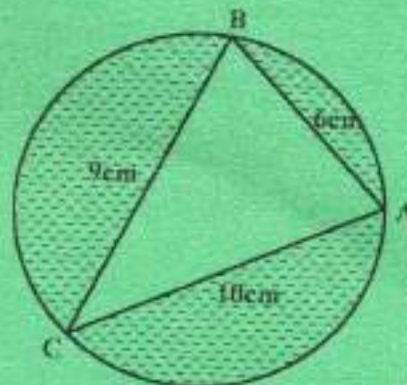


Fig. 1

Calculate:

- (i) the radius of the circle;
- (ii) the area of the shaded part.



(10 marks)

- (b) A triangle PQR is such that $PQ = 36$ cm, $QR = 40$ cm and $PR = 42$ cm.

Calculate:

- (i) the area of the triangle;
- (ii) the angles PQR and PRQ.

(10 marks)

5. (a) Suppose that the probability that it is raining when you go into the college is $\frac{1}{3}$ and that it is not raining when you come out of it, is $\frac{1}{6}$. What is the probability that it is:

- (i) raining in both occasions;
- (ii) not raining on both occasions.

(12 marks)

- (b) A bag contains 18 balls, 12 red and 6 blue. A ball is drawn at random from the bag, its colour noted and then replaced. A second ball is drawn from the bag, what is the probability that the two balls are:

- (i) both blue;
- (ii) one of each colour.

(4 marks)

(c) From equation 5(b) above, if the first ball is not replaced, find the probability the two balls are:

- (i) both red;
 (ii) one of each colour.

(4 marks)

6. (a) Simplify the following:

(i) $\begin{pmatrix} 2 & -2 \\ 5 & 0 \end{pmatrix} + 3\begin{pmatrix} 1 & 9 \\ 12 & -4 \end{pmatrix}$

(ii) $\begin{pmatrix} 5 & 4 \\ 2 & 0 \end{pmatrix} \begin{pmatrix} -2 & 1 \\ 7 & 5 \end{pmatrix}$

(4 marks)

(b) Solve the pair of simultaneous equations by matrix method:

$$\begin{aligned} 2x - 3y &= 7 \\ x + 2y &= 7 \end{aligned}$$

(10 marks)

(c) $\begin{pmatrix} a & 2a \\ a-1 & a+1 \end{pmatrix}$ is a singular matrix.

Find possible values of a.

(6 marks)

7. (a) Find the sum of the first 8 terms of the series $2 + 4 + 8 \dots$

(3 marks)

(b) A geometric series is such that its first term is 2. Find the two possible common ratios if the sum of its first three terms is 26.

(7 marks)

(c) The value of a machine originally valued at Ksh. 5,000 depreciates at 12% per annum. Determine its value after 5 years. The machine is sold when its value is less than Ksh. 800. After how many years is the machine sold?

(10 marks)

8. If $V_1 = 20$ units at 70° , $V_2 = 30$ units at 160° and $V_3 = 25$ units at 210° , calculate the resultant of:

(a) $V_1 - V_2 + V_3$

(10 marks)

(b) $V_2 - V_1 - V_3$

(10 marks)

