

NAME.....

INDEX.....

SCHOOL.....

CANDIDATE'S SIGN.....

DATE.....

121/1

MATHEMATICS

FORM 4

MARCH/APRIL 2013

TIME: 2 ½ HOURS

# WESTERN ZONE JOINT EXAMINATIONS (WEZOJE) - 2013

The Kenya Certificate of Secondary Education

## Instructions to Candidates

1. Write your name, class and admission number in the space provided at the top of this page.
2. This paper has two sections: Section I and Section II.
3. Answer all questions in Section I and any five questions in section II.
4. All answers and working must be written on the question paper in the space provided below each question.
5. Marks may be awarded for correct working even if the answer is wrong.
6. Non-programmable silent electronic calculators and KNEC Mathematical Tables may be used except where stated otherwise.

## FOR EXAMINERS USE ONLY

### Section I

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

### Section II

17	18	19	20	21	22	23	24	Total

**SECTION I**  
**ANSWER ALL QUESTIONS IN THIS SECTION**

1. Evaluate without using tables or calculator. (3marks)

$$\frac{0.11 \times 0.29 \times 72.25}{0.55 \times 5.8 \times 1.7}$$

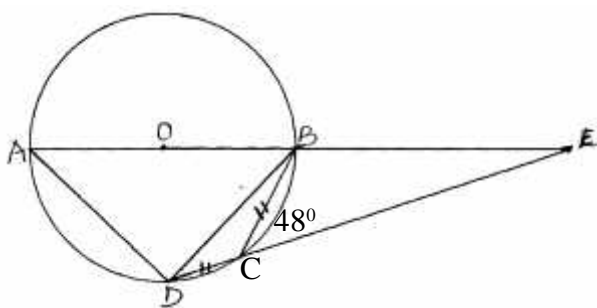
2. A line L passes through point (3,1) and is perpendicular to the line  $2y = 4x + 5$ . Determine the equation of line L. (3marks)

3. Solve the following inequalities and represent the solution on a number line and hence state the integral values of X. (4marks)

$$7x - 4 \leq 9x + 2 < 3x + 14$$

4. Koech left home to a shopping centre 12km away, running at 8km/h. Fifteen minutes later, Mutua left the same home and cycled to the shopping centre at 20km/h. Calculate the distance to the shopping centre at which Mutua caught up with Koech. (3marks)

5. In the figure below ABCD is a circle with centre O. AB and DC meet at a point E outside the circle.  $DC = BC$  and  $\angle BCE = 48^\circ$ .



Find the angles;

(3marks)

i)  $\angle BAD$

ii)  $\angle BDC$

iii)  $\angle BEC$

6. A quantity P is partly constant and partly varies as Q. If  $Q = 9$  when  $P = 3$  and  $Q = 3$  when  $P = 15$ . Find the value of P when  $Q = 12$ . (4marks)

7. Given that  $5^x \times 3^{2y} = 2025$ , find the value of x and y. (3marks)

8. Use reciprocal, squares and square root tables to evaluate, to 4 significant figures the expression.

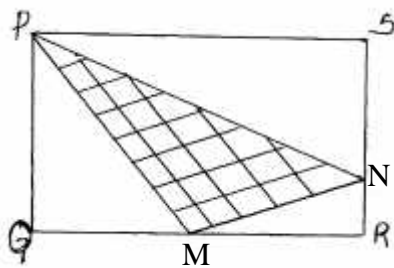
$$\sqrt{\frac{1}{24.56} + 4.346^2}$$
 (3marks)

9. Four bells ring at intervals of 9 minutes, 12 minutes, 15 minutes and 21 minutes. The bells will ring together at 10.00a.m. Find the time the bells will ring together again. (3marks)

10. The sum of two numbers is 15. The difference between five times the first number and three times the second number is 19. Find the two numbers. (3marks)

11. Sixteen men working at the rate of 9 hours a day, can complete a piece of work in 14 days. How many more men working at the rate of 7 hours a day would complete the same job in 12 days. (2marks)

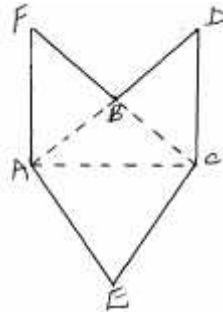
12. In the figure below PQRS is a rectangle in which  $PS = 10\text{cm}$  and  $PQ = 6\text{cm}$ . M and N are mid points of QR and RS respectively. Find the area of the shaded part. (4marks)



13. A business woman bought sterling pounds (£) equivalent to Ksh. 600,000. After settling bills worth £ 1200, she changed the balance to Euros. She then purchased goods worth £ 200. Using the exchange rate below. Calculate his balance in Kshs. (3marks)

	Buying	Selling
1 sterling pound	114.20	114.50
1 Euro	101.20	101.30

14. Draw the solid of the given net below. (2marks)



Given that the length  $AB=BC=AC=6\text{cm}$  and lengths  $AF = BD = CE = AE = FB = CD = 8\text{cm}$ .  
Take triangle ABC as the base and height is 5cm.

15. A village water tank is in the form of a frustrum of a cone of height 3.2m. The top and bottom radii are 18m and 24m respectively. Calculate the capacity of the tank. (3marks)

16. Find the centre and the radius of the circle whose equation is given by  $x^2 + y^2 - 2x + 4y - 11 = 0$ . (3marks)

**SECTION II**  
**ANSWER ANY FIVE QUESTIONS ONLY**

17. Sonko is a sales executive earning a salary of Ksh. 30,000 and a commission of 10% for the sales in excess of Ksh, 100,000. If in December 2012 she earned a total of Kshs. 50,000 in salaries and commissions.

a) Determine the amount of sales that she made in that month. (4marks)

b) If the total sales in the month of January and February 2013 increased by 18% and then dropped by 25% respectively. Calculate;

i) Jane's commission in the month of January. (3marks)

ii) Her total earning in the month of February. (3marks)

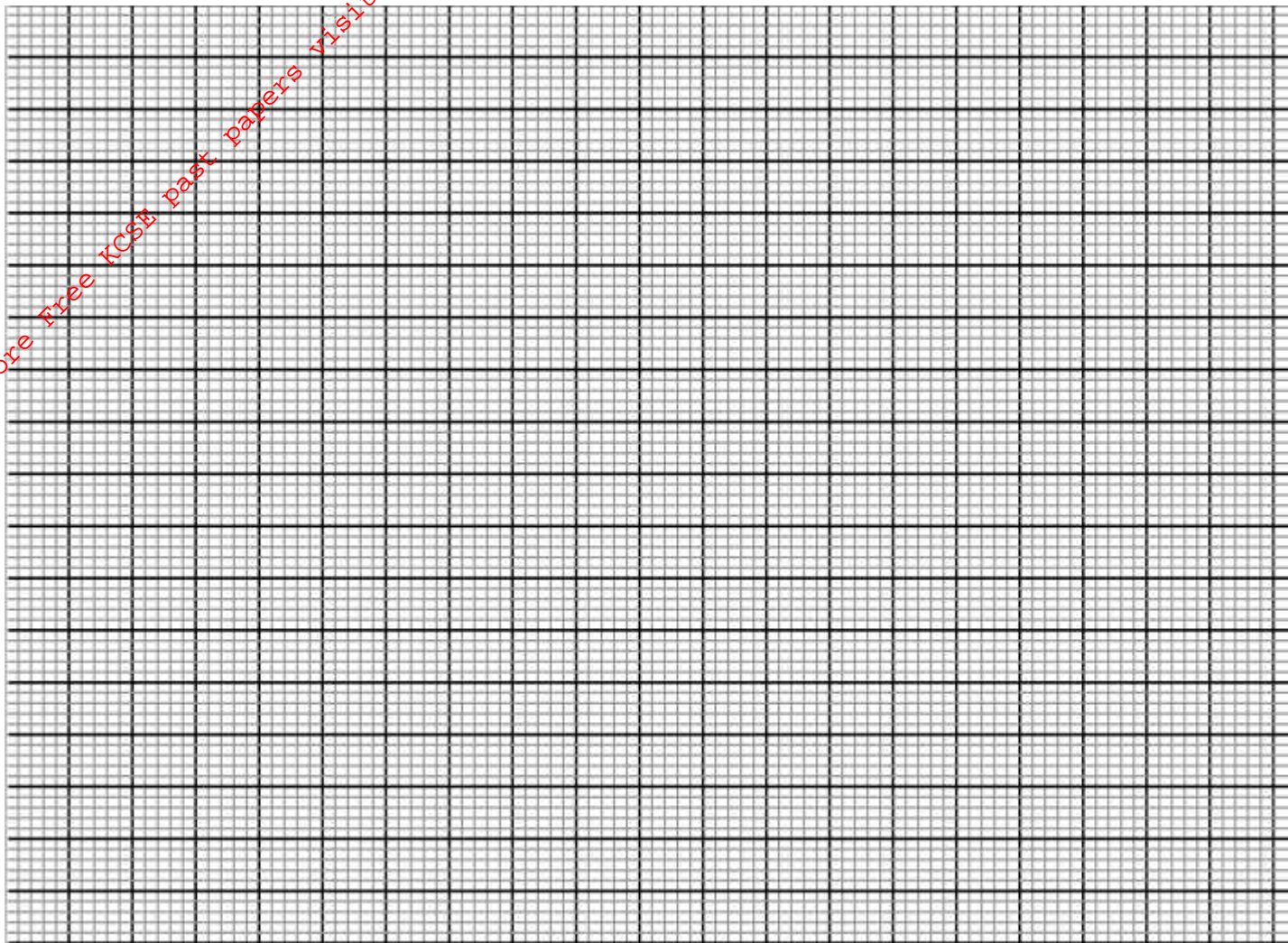


18. Given the equation of a quadratic curve  $y = x^2 + 5x - 3$

a) Complete the table below for the function  $y = x^2 + 5x - 3$  for  $-6 \leq x \leq 1$  (2marks)

x	-6	-5	-4	-3	-2	-1	0	1
y		-3	-7		-9		-3	3

ii) Draw the graph of  $y = x^2 + 5x - 3$  for  $-6 \leq x \leq 1$ . (3marks)



b) i) State the equation of the line of symmetry for the graph. (1mark)

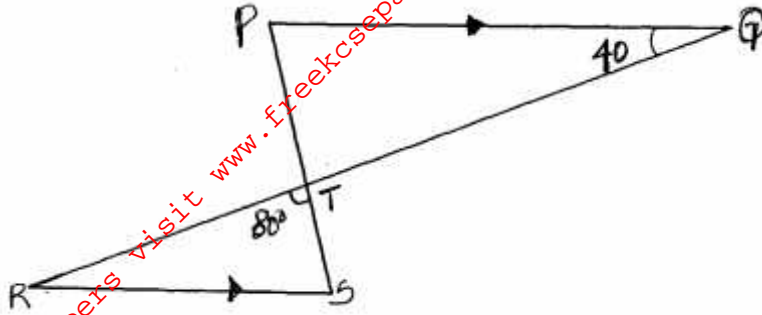
ii) Use your graph to solve the equations.

I.  $X^2 + 5x - 3 = 0$  (1mark)

II.  $X^2 + 4x - 2 = 0$  (2marks)

III.  $X^2 + 5x - 3 = -3$  (1mark)

19. In the figure below, PQ is parallel to RS. The lines PS and RQ intersect at T.  $RQ = 10\text{cm}$ ,  $RT : TQ = 3 : 2$ , angle  $PQT = 40^\circ$  and angle  $RTS = 80^\circ$ .



- a) Find the length of RT. (2marks)
- b) Determine, correct to 2 significant figures.
- i) The perpendicular distance between PQ and RS. (2marks)
- ii) The length of TS (2marks)
- c) Using cosine rule, find the length of RS correct to 2 significant figures. (2marks)
- d) Calculate, correct to one decimal place, the area of triangle RST. (2marks)

20. a) Draw a triangle ABC in which  $AB = 6\text{cm}$ ,  $BC = 5.5\text{cm}$  and  $\angle B = 60^\circ$  (Use pair of compasses and ruler only) then measure AC. (2marks)

- b) Four town P, Q, R and S are such that Q is 120km due east of town P. Town R is 160km due North of Q. Town S is on a bearing of  $330^\circ$  from P and on a bearing of  $300^\circ$  from R (use ruler and pair of compasses only for all constructions in this question). Taking scale of  $1\text{cm} = 50\text{km}$ , construct by a scale diagram showing the relative positions of towns P, Q, R and S. (5marks)

- c) Use your scale drawing to determine;

- i) The distance SP (1mark)
- ii) The distance SR (1mark)
- iii) The bearing of town S from town Q. (1mark)

21. A wholesaler sells salt in packets of two sizes: small and large. The amounts of salt contained in these packets are 500g and 1kg. A retailer bought them at Sh. 7 and Sh. 15 respectively.

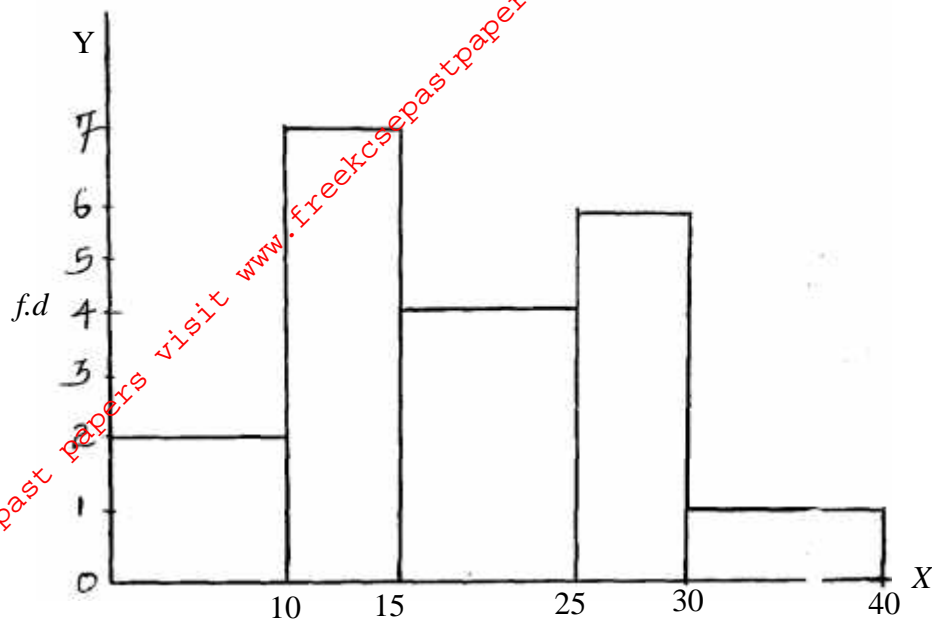
a) Write down two column matrices, one for amount and one for cost. (2marks)

b) The retailer ordered 2 dozen large and  $3\frac{1}{2}$  dozen small packets. Write this information as a row matrix. (1mark)

c) By multiplying the matrices, calculate the total amount of salt ordered in Kilograms. (3marks)

d) How much did the order cost. (4marks)

22. Below is a histogram drawn by a student of Got Osimbo Girls Secondary School.



a) Develop a frequency distribution table from the histogram above.

(5marks)

b) Use the frequency distribution table above to calculate,

(3marks)

i) The inter-quartile range.

ii) The sixth decile.

(2marks)

23. a) The 2<sup>nd</sup>, 4<sup>th</sup> and 7<sup>th</sup> terms of an AP are the first 3 consecutive terms of a GP, find the common ratio. (5marks)

- b) Find the sum of the first eight terms of the GP if the common difference of the AP is 2. (5marks)

24. a) 2.5 litres of water density  $1\text{ g/cm}^3$  is added to 8 litres of alcohol of density  $0.8\text{ g/cm}^3$ . Calculate the density of the mixture. (3marks)

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- b) A squared brass plate is 2mm thick and has a mass of 1.05kg. The density of brass is  $8.4\text{ g/cm}^3$ . Calculate the length of the plate in centimeters. (4marks)

- c) A man is 24 years older than his son now. After ten years, he will be three times as old as his son. How old was his son one year ago. (3marks)

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