

K.C.S.E. YEAR 2010 MATHEMATICS PAPER 1

SECTION 1 (50 Marks)

Answer all the question in this section in the spaces provided.

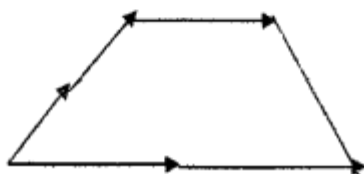
1. Without using a calculator evaluate,

$$\frac{2(5+3) - 9 \div 3 + 5}{3 \times 5 + 2 \times 4}$$

2. Kutu withdraw money from a bank. He spent $\frac{3}{8}$ of the money to pay for Mutua's school fees and $\frac{2}{5}$ to pay for Tatu's school fees. If he remained with Ksh. 12330, calculate the amount of money he paid for Tatu's school fees. (4 marks)
3. A straight line / passes through the point (3, -2) and is perpendicular to a line whose equation is $2y - 4x =$ Find the equation of / in the form $y = mx + c$, where m and c are constants. (3 marks)
4. A bus left a petrol station at 9.20 am and travelled at an average speed of 75 km/h to a town N. At 9.40 am a taxi, travelling at an average speed of 95km/h, left the same petrol station and followed the route of the bus.
Determine the distance, from the petrol station, covered by the taxi at the time it caught up with the bus. (3 marks)
5. The sum of three consecutive odd integers is greater than 219. Determine the first three such integers. (3marks)
6. A Kenyan Company received US Dollars 100.000. The money was converted into Kenya Shillings in a bank which buys and sells foreign currencies as follows:

	Buying (in Kenya Shillings)	Selling (in Kenya Shillings0)
1 US Dollar	77.24	77.44
1 Sterling Pound	121.93	122.27

- (a) Calculate the amount of money, in Kenya shillings, the company received. (2marks)
- (b) The company exchanged the Kenya Shillings 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)
7. In the figure below, OPQR is a trapezium in which PQ is parallel to OR and M is the mid-point of QR. $OQ = P$, $OR = r$ and $PQ = \frac{1}{3}OR$.



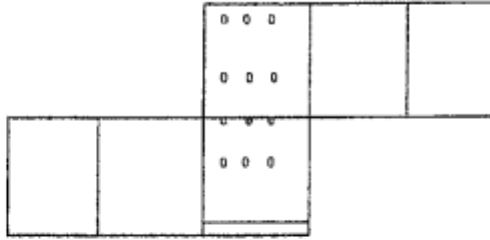
Find OM in terms of p and r.

(3 marks)

8. Without using mathematical tables or a calculator, evaluate $27^{\frac{2}{3}} \times (\frac{81}{16})^{\frac{1}{4}}$

(3marks)

9. The figure below is a net of a cube with some dots on two faces.



Given that the number of dots on pairs of compasses only, construct a rhombus QRST in which angle TOR = 60° and QS = 10 cm. (2 marks)

10. Using a ruler and a pair of compasses only, construct a rhombus QRST in which angle TQR = 60° and QS = 10 cm. (3 marks)
11. A fruit vendor bought 1948 oranges on a Thursday and sold 750 of them on the same day. On Friday, he sold 240 more oranges than on Thursday. On Saturday he bought 560 more oranges. Later that day, he sold all the oranges he had at a price of Kshs 8 each. Calculate the amount of money the vendor obtained from the sales of Saturday.

(4 marks)

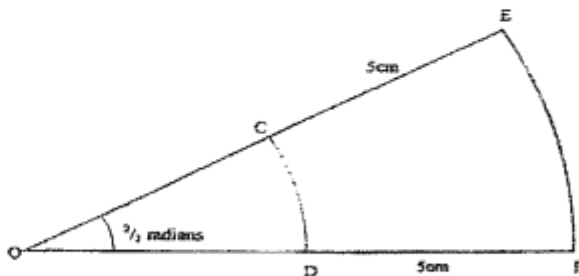
12. Simplify the expression $\frac{x^2 + x - 4xy - 4y}{(x + 1)(4y^2 - xy)}$

(3 marks)

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

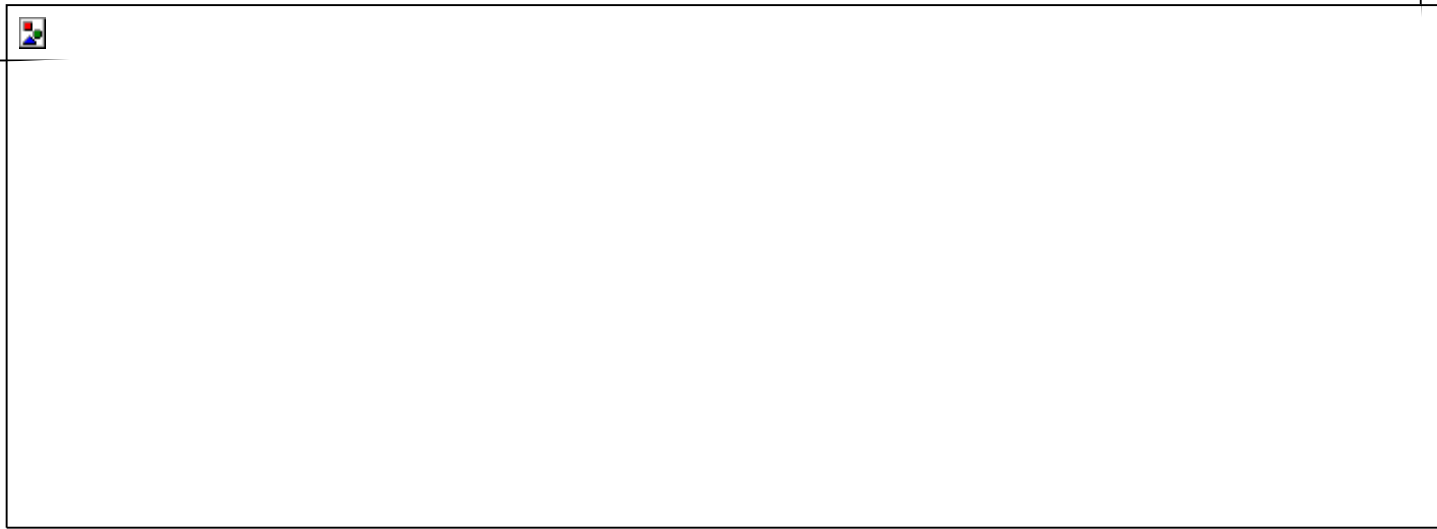
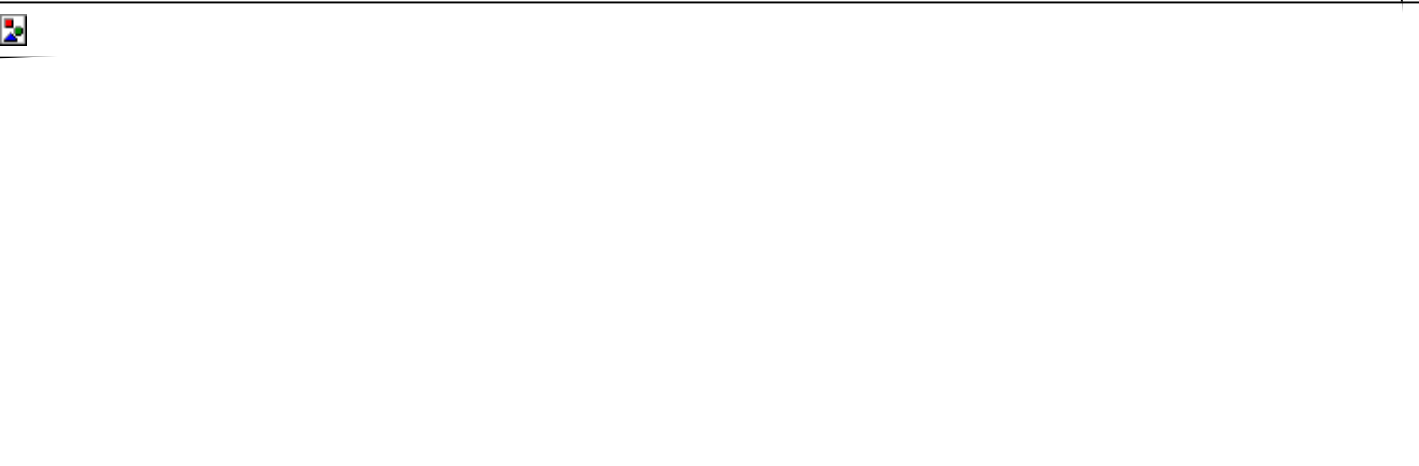
14. A Cylindrical solid whose radius and height are equal has a surface area of 154 cm^2 . Calculate its diameter, correct to 2 decimal places. (Take $\pi = 3.142$) (3 marks)

15. The figure below shows two sectors in which CD and EF are arcs of concentric circles, centre O. Angle COD = $\frac{2}{3}$ radians and CE = DF = 5 cm



If the perimeter of the shape CDFE is 24 cm, calculate the length of OC. (3 marks)

16. The histogram shown below represents the distribution of heights of seedlings of a certain plant.





Ecolebooks.com



- (a) Describe fully:
- (i) A reflection that maps triangle QCE onto triangle SDE (1 mark)
 - (ii) An enlargement that maps triangle QCE onto triangle SAE (2 marks)
 - (iii) A rotation that maps triangle QCE onto triangle SED. (3 marks)
- (b) The triangle ERC is reflected on the line BD. The image of ERC under the reflection is rotated clockwise through an angle of 90° about P.
- (i) Under the reflection; (2 marks)
 - (ii) After the two successive transformations. (2 marks)

23. The frequency distribution table below represents the number of kilograms of meat sold in a butchery.

Mass in Kg	1-5	6-10	11-15	16-20	21-25	26-30	31-35
Frequency	2	3	6	8	3	2	1

- (a) State the modal frequency (1 mark)
 - (b) Calculate the mean mass. (5 marks)
 - (c) Calculate the median mass. (4 marks)
24. A rectangular box open at the top has a square base. The internal side of the base is x cm long and the total internal surface area of the box is 432cm^2 .
- (a) Express in terms of x :
- (i) The internal height h , of the box; (3 marks)
 - (ii) The internal volume V , of the box (1 mark)
- (b) Find:
- (i) The value of x for which the volume V is maximum; (4 marks)
 - (ii) The maximum internal volume of the box (2 marks)