

2013 JCE @ MATHEMATICS QUESTIONS

***ONLY QUESTIONS**

Answer all the twenty questions.

1. Simplify $\frac{4 - (-5) - 13}{-2}$. (3 marks)
2. Simplify $3x^{-1}(2x)^2$. (3 marks)
3. Given that set $P = \{2, 3\}$, write down all the subsets of the set. (4 marks)

4. In Figure 1, AB is parallel to DFC and EBF is a straight line. Angle $CBE = 104^\circ$ and $ABF = 40^\circ$.

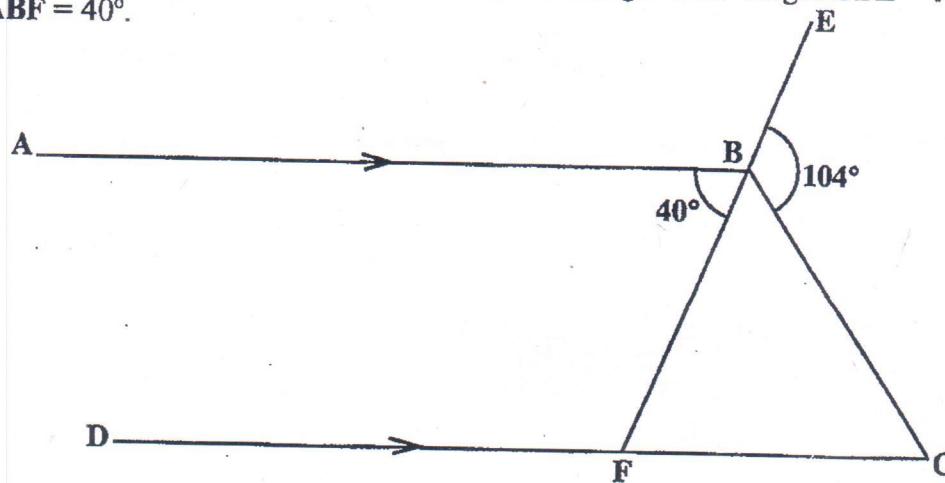


Figure 1

Calculate angle BCF .

(4 marks)

5. A class discussion group consists of Chisomo, Jala, Kaligo, Sentiya, Sella, Bulla, Sofia, Kant and Sikenala. A student is chosen at random to make a presentation. Find the probability that the student's name starts with a letter S.

(3 marks)

6. Convert 134_5 to base 3. (5 marks)

7. Given that in triangle ABC, angle ACB = 90° , AB = 7cm and AC = 5cm, calculate the length of BC giving your answer correct to one decimal place.

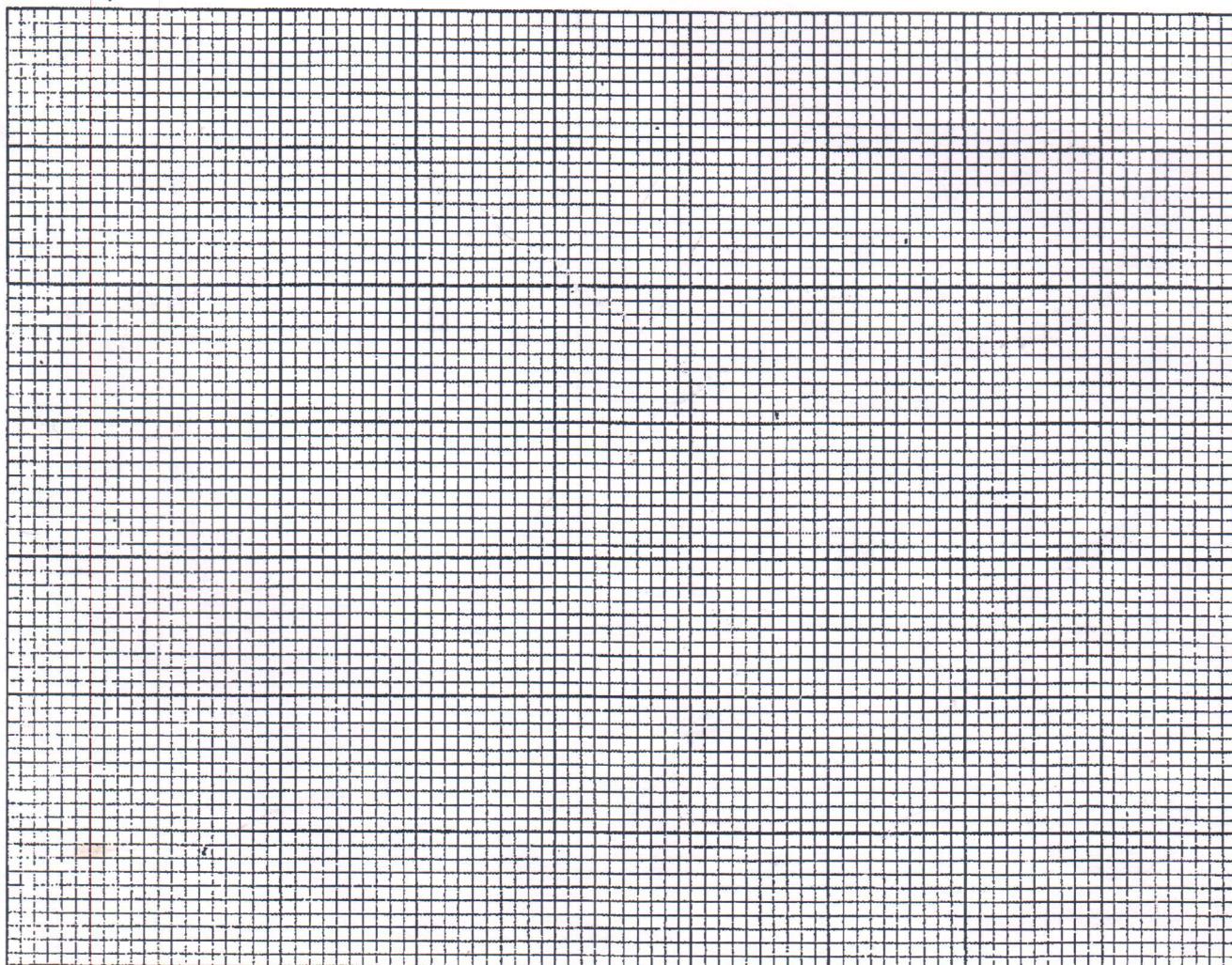
(4 marks)

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8. The **table** below shows the values of x and y for the equation $y = 2 - x$.

x	-3	0	2
y		2	

- a. Complete the table of values for the equation $y = 2 - x$. **(2 marks)**
- b. Using a scale of 2 cm to represent 2 units on both axes, draw the graph of $y = 2 - x$. **(3 marks)**



Continued/...

9. a. Make t the subject of the formula $m = \frac{t}{b} - c$. (3 marks)
- b. Solve the equation $x(x - 3) = 28$. (5 marks)

10. Given the following sequence of numbers: 12, 23, 34, _____, _____, ..., write down the next two numbers of the sequence. (4 marks)

11. Figure 2 shows a quadrilateral ABCD.

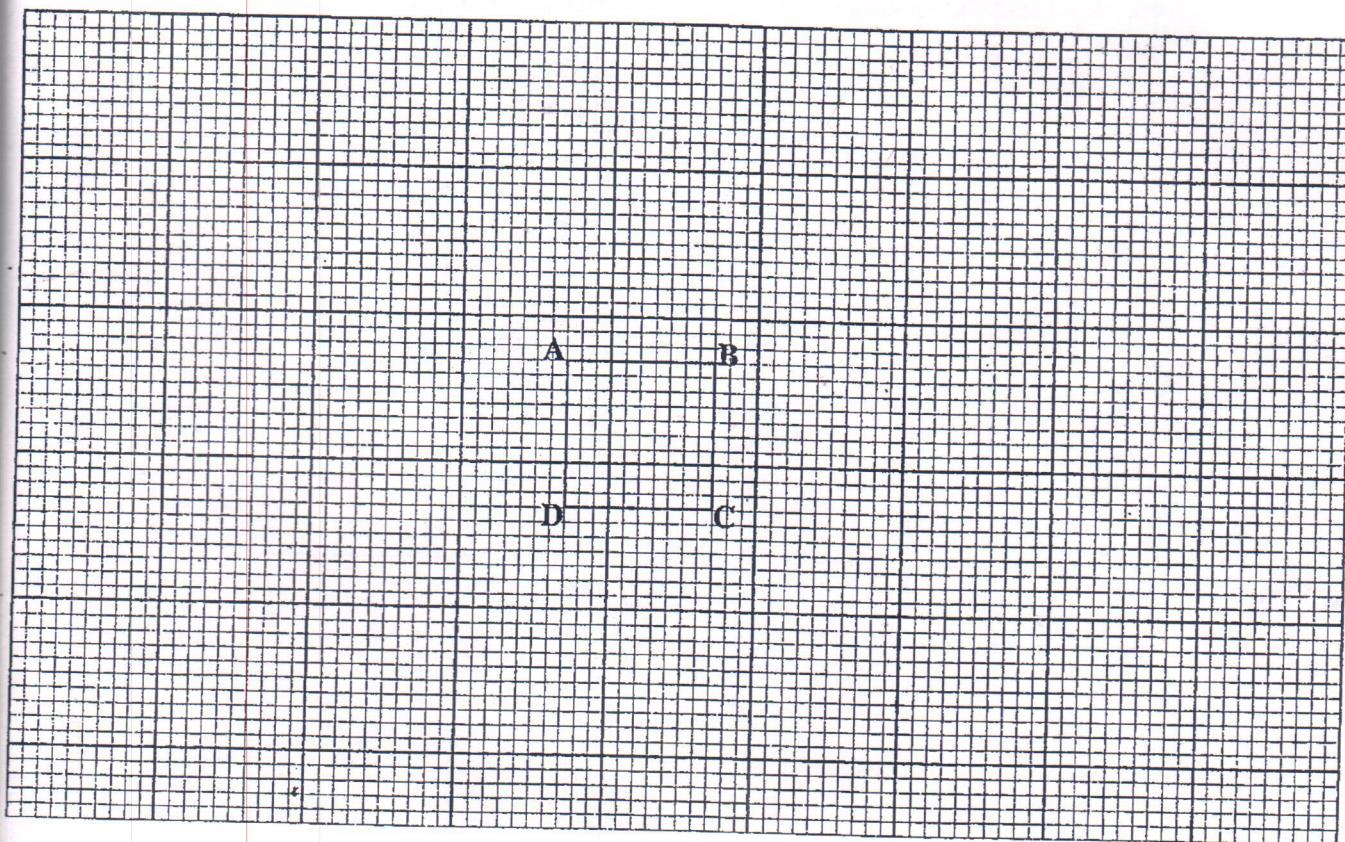


Figure 2

Using D as a centre of enlargement and 2 as a scale factor, draw in the same figure, an enlargement of quadrilateral ABCD. (3 marks)

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12. a. Solve the inequality $2p - 17 < 5p - 2$. **(3 marks)**
- b. The exterior angle of a regular convex polygon is 4 times its interior angle. Given that the exterior angle is y , calculate the number of sides of the polygon. **(5 marks)**

13. a. Factorise completely $m^3 - m$. (3 marks)

- b. Figure 3 shows a point A(2, 1) on a grid.

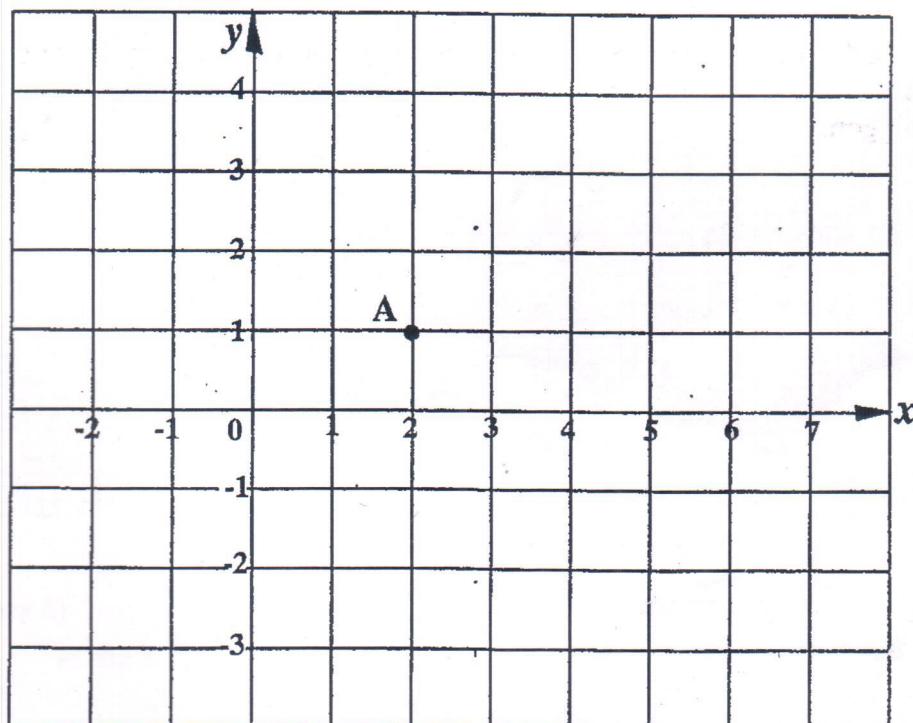


Figure 3

Given that $\vec{AB} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$, using the same grid, draw \vec{AB} . (4 marks)

Continued/...

14. a. The electricity company charges a fixed amount of K1 041 per month and each unit costs K15.15. If a family used 200 units in a certain month, calculate the bill which the family paid that month. (3 marks)

b. Given the equation $2x - y = -1$, find:

(i) y -intercept

(ii) Gradient of the equation

(3 marks)

Continued/...

15. Figure 4 shows a diagram with arrow heads on both ends drawn on a graph paper.

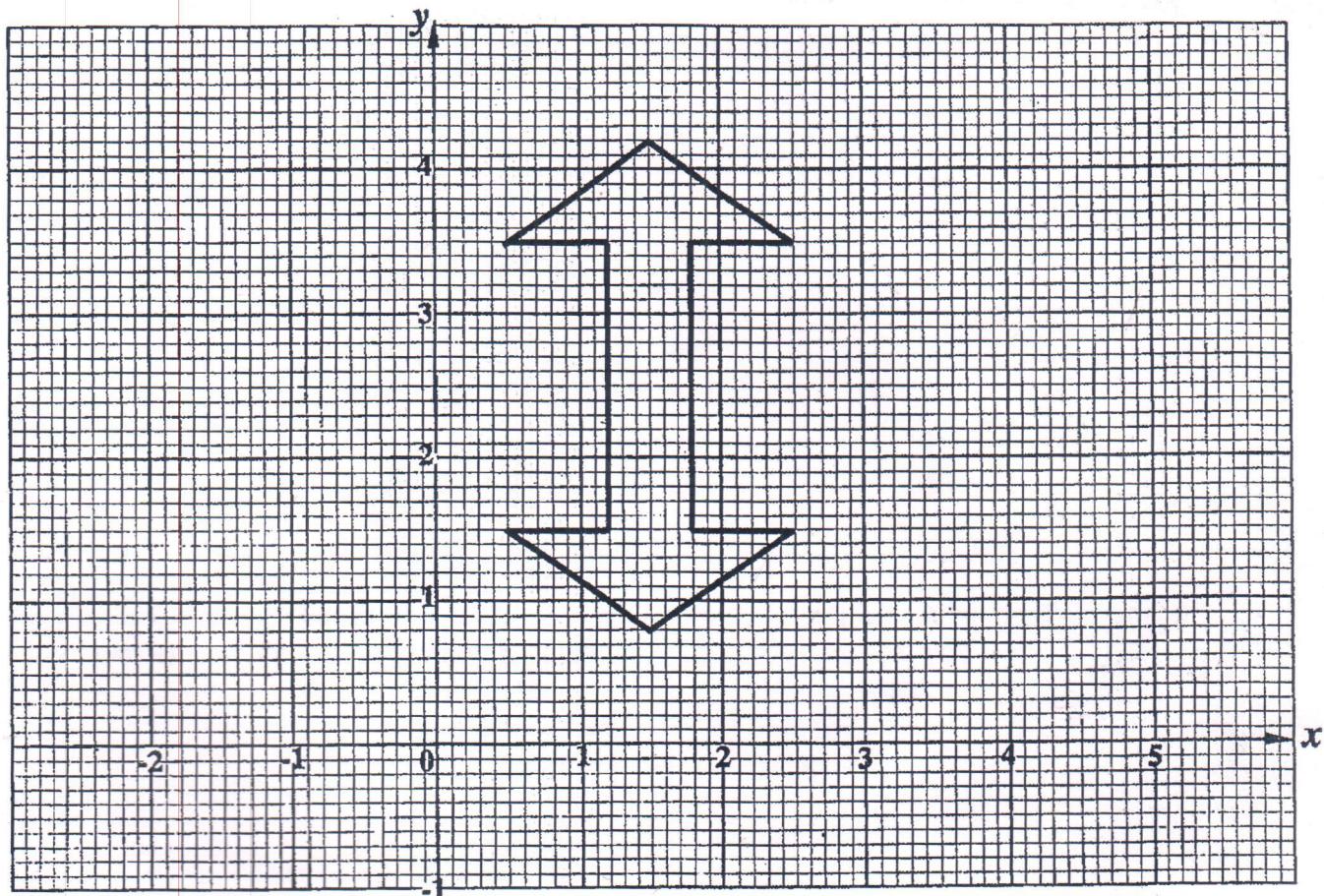


Figure 4

- In the same diagram, draw all the lines of symmetry for the diagram. (2 marks)
- Write down the equations of the lines of symmetry drawn in 14.a. (2 marks)

16.

a.

Given that $x = -3$, $y = -6$ and $z = 9$, find the value of

$$\frac{xy - z}{x}$$

(3 marks)

b.

Team M scored the following goals: 4, x , 1, 5 in four consecutive matches.

Given that the mean score is 3, calculate the value of x .

(4 marks)

17. a. Using a ruler and a pair of compasses only, construct in the same diagram:

- (i) Triangle EFG in which $EF = 8 \text{ cm}$, $FG = 7 \text{ cm}$ and $GE = 6 \text{ cm}$
- (ii) A locus of points equidistant from EF and EG
- (iii) A point H on the locus such that $EH = 10 \text{ cm}$

(5 marks)

b. Measure and state the length of FH.

(1 mark)

18. Use logarithms to evaluate $(2.01)^3$ and give your answer correct to 3 significant figures.

(4 marks)

19. Dziwa travelling by car left town A for town B 120 km away at 6:00 am at a constant speed of 40 km/h. Bweza also travelling by car left town B at 6:30 am for town A at a constant speed of 60 km/h.
- a. Using a scale of 2 cm to represent 30 minutes on the horizontal axis and 2 cm to represent 20 km on the vertical axis, draw on the same axes, graphs to show the journeys of Dziwa and Bweza. **(6 marks)**



- b. Using your graphs, find the time at which the two cars met. **(1 mark)**

20. Figure 5 shows a square based right pyramid $RSTUV$ in which $UT = 6 \text{ cm}$ and slant height $VW = 8 \text{ cm}$.

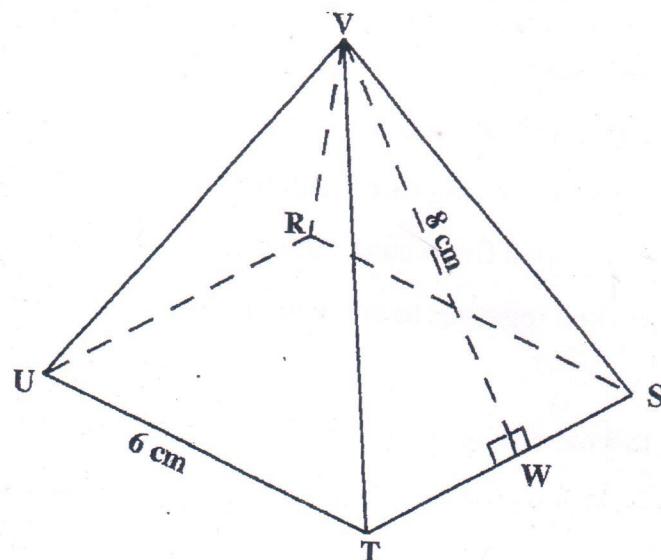


Figure 5

Calculate the total surface area of the pyramid.

(5 marks)

END OF QUESTION PAPER

NB: This paper contains 15 pages.