



PROVISIONAL MARKING KEY

THYOLO DISTRICT EXAMINATION BOARD

2026 JUNIOR CERTIFICATE MOCK EXAMINATION

MATHEMATICS

(100 Marks)

Alternative formulae are 100% allowed

Friday, 20th March, 2026

Subject Number: J131

Time allowed: 2 hours

8:00 – 10:00 am

Instructions

1. This paper contains 12 pages. Please check.
2. Answer **all** the questions in this paper.
3. The maximum number of marks for each answer is indicated against each question.
4. Write your answers in the space provided for each question.
5. Calculators may be used.
6. The blank answer sheet provided at the end of the question paper can be used if required.
7. All working must be clearly shown.
8. Write your **name** and name of your school on all pages of the question paper in the spaces provided.
9. In the table provided on this page, tick against the question number you have answered.

Question Number	Tick if answered	Do not write in the columns
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
Total		

Corregendum

On question paper

Q1b the answer should be to page 4,

*Q8 LM = 7cm, LN = 10cm and the other one
JK = 7cm and JL = 10cm*

Answer all the twenty questions

1. a. Given that $a = 4$, $b = -2$ and $c = -3$, evaluate $\frac{ab-c}{b+c}$.

(3 marks)

$$\frac{ab-c}{b+c}$$

$$\frac{4 \times -2 - (-3)}{-2 + (-3)} \quad (1)$$

$$\frac{-8 + 3}{-2 - 3} \quad (1)$$

$$\frac{-5}{-5} = 1 \quad (1)$$

- b. Add 1232₄ to 2233₄, giving your answer in base 4 (should be to base 4 not 3)

$$\begin{array}{r} 1232_4 \\ + 2233_4 \\ \hline 10131_4 \end{array}$$

1 mark for addition symbol

1 mark for working out

1 mark for correct answer

1 mark for correct base 4 on the answer

(4 marks)

2. a. Simplify $(4m - 3n) - (m + 3n)$ to the lowest term.

$$(4m - 3n) - (m + 3n)$$

$$4m - 3n - m - 3n \quad (1)$$

$$4m - m - 3n - 3n$$

$$3m - 6n \quad (1)$$

$$3(m - 2n) \quad (1)$$

(3 marks)

- b. Evaluate $\frac{p-3q}{5r} \div \frac{3p-9q}{10t}$

$$\frac{p-3q}{5r} \times \frac{10t}{3p-9q} \quad (1)$$

$$\frac{\cancel{p-3q}}{5r} \times \frac{10t}{3(\cancel{p-3q})} \quad (2)$$

(4 marks)

$$\frac{2t}{3r} \quad (1)$$

3. a. Make m subject of the formula in $P = \frac{mv - mu}{t}$ (3 marks)

$$t \times P = \frac{mv - mu}{t} \times t$$

$$tp = mv - mu \quad (1)$$

$$\frac{m(v-u)}{(v-u)} = \frac{tp}{(v-u)} \quad (1)$$

$$\therefore m = \frac{tp}{(v-u)} \quad (1)$$

- b. Simplify $(x^3)^5 + x^6$ (3 marks)

$$(x^3)^5 \div x^6$$

$$x^{15} \div x^6 \quad (1)$$

$$x^{15-6} \quad (1)$$

$$x^9 \quad (1)$$

4. Figure 1 shows a Venn diagram

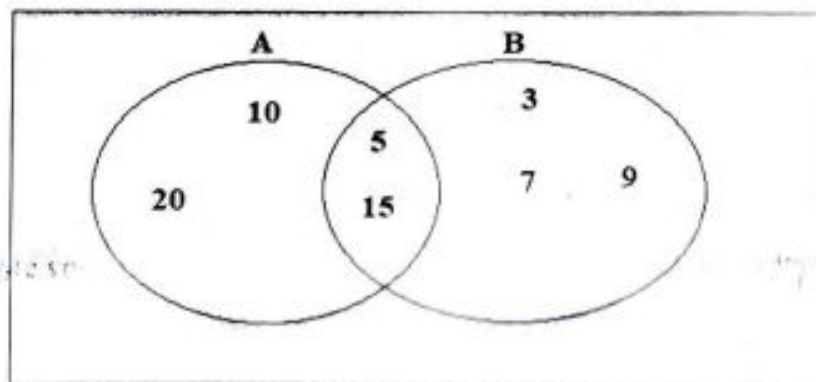


Figure 1

- (i) Write a set representing $A \cup B$

$$A = \{5, 10, 15, 20\} \quad (1)$$

$$B = \{3, 5, 7, 9, 15\} \quad (1)$$

$$A \cup B = \{3, 5, 7, 9, 10, 15, 20\} \quad (1)$$

(3 marks)

(ii) Write a set showing elements in set B only.

$$\text{Set B only} = \{3, 7, 9\}$$

(1 mark)

5. The size of each interior angle of a regular convex polygon is $(x^2 + 20)^\circ$ and its exterior angle is $(x^2 - 40)^\circ$. Calculate the number of sides of the polygon. (5 marks)

$$\text{ext } \angle + \text{int } \angle = 180^\circ$$

$$x^2 + 20 + x^2 - 40 = 180^\circ \quad (1)$$

$$x^2 + x^2 + 20 - 40 = 180^\circ$$

$$2x^2 - 20 = 180$$

$$2x^2 = 180^\circ + 20^\circ$$

$$\frac{2x^2}{2} = \frac{200^\circ}{2}$$

$$\sqrt{x^2} = \sqrt{100^\circ} \quad (1)$$

$$x = 10 \quad (1)$$

$$n = \frac{360^\circ}{\text{ext } \angle}$$

$$\text{ext } \angle = x^2 - 40$$

$$= 10^2 - 40$$

$$= 100 - 40$$

$$= 60 \quad (1)$$

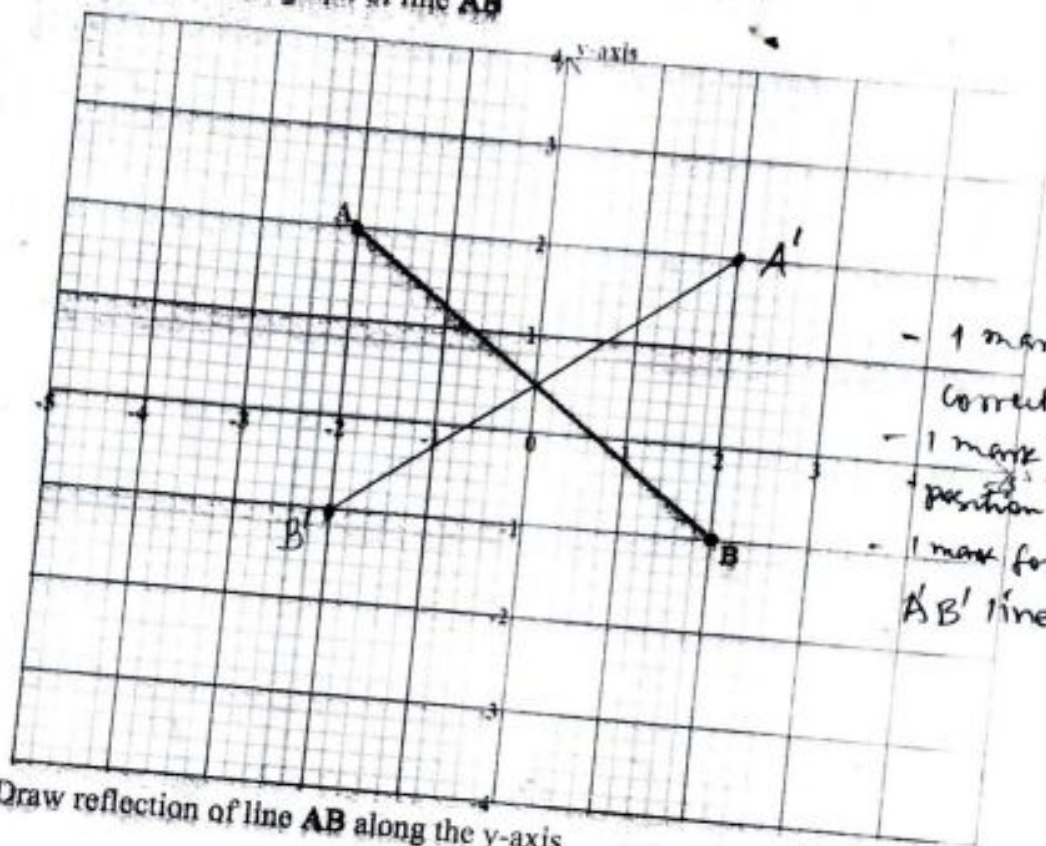
$$n = \frac{360^\circ}{60^\circ} = 6 \quad (1)$$

$$n = 6 \quad (1)$$

NAME: _____

SCHOOL: _____

6. Figure 2 shows graph of line AB



- 1 mark for correct position of A
- 1 mark for correct position of B'
- 1 mark for the correct A'B' line

Draw reflection of line AB along the y-axis

(3 marks)

7. Solve the equation $x^2 - 9x = -14$

(4 marks)

$$x^2 - 9x = -14$$

$$x^2 - 9x + 14 = 0 \quad (1)$$

$$x^2 - 2x - 7x + 14 = 0 \quad (1)$$

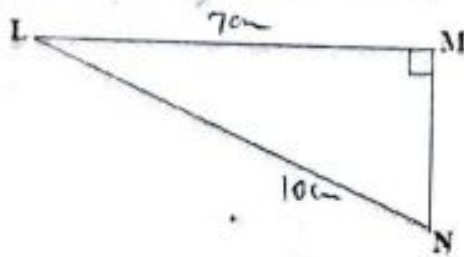
$$x(x-2) - 7(x-2) = 0$$

$$(x-2)(x-7) = 0$$

$$x-2=0, \text{ or } x-7=0 \quad (1)$$

$$\therefore x=2 \text{ or } x=7 \quad (1)$$

8. Figure 3 shows triangle LMN and triangle JKL

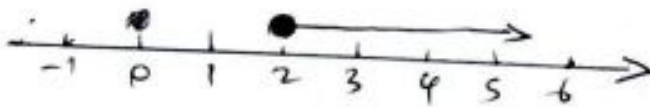


In $\triangle LMN$ and $\triangle JKL$
 $LM = JK$ (given) (1)
 $\angle M = \angle K$ (right $\angle$) (1)
 $LN = JL$ (given) (1)
 $\therefore \triangle LMN \equiv \triangle JKL$ (RHS) (1)

Prove that triangle LMN is congruent to triangle JKL. (4 marks)

9. Solve the inequality $5 - 2x \leq x - 1$ and show your answer on a number line. (6 marks)

$$\begin{aligned} 5 - 2x &\leq x - 1 \\ -2x - x &\leq -1 - 5 \quad (1) \\ -3x &\leq -6 \quad (2) \\ \frac{-3x}{-3} &\leq \frac{-6}{-3} \\ x &\geq 2 \end{aligned}$$



1 mark for collecting like terms
 1 mark for working out correctly on each side
 1 mark for cancellation
 1 mark for reversing inequality sign
 1 mark for correct answer
 1 mark for showing the answer on number line correctly

10. Mr Tonde works with Ministry of Education in Malawi. He grossly earns K465,500 monthly and pays tax (PAYE) calculated as follows

Table 2

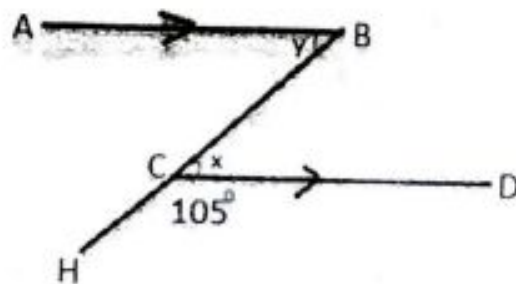
Amount (MK)	Rate (%)
100 000 below	0
Next 300 000	25
Excess of 300 000	30

First K100 000 = 0% = K0 (1)
 Next K300 000 = 25% of K300 000 = K75 000 (1)
 In excess of K300 000 = 30% of K165 500 = K49 650 (1)

Calculate the net salary Mr Tonde earns per month (5 marks)

$$\begin{aligned}\text{Total tax} &= K75000 + K19500 \quad (1) \\ &= K94500 \quad (1)\end{aligned}$$

11. In Figure 4 below AB is parallel to CD. BCH is a straight line.



$$\begin{aligned}x + 105^\circ &= 180^\circ \text{ (s on a str line)} \quad (1) \\ x &= 180^\circ - 105^\circ \\ x &= 75^\circ \quad (1) \\ x &= y \text{ (alt \angle s)} \quad (1) \\ y &= 75^\circ \quad (1)\end{aligned}$$

(4 marks)

Figure 4

Calculate the values of angles marked x and y given that angle HCD = 105°

12. Solve the simultaneous linear equations below:

$$5n + 2m = 10$$

$$3m + 7n = 29$$

$$\begin{aligned}5n + 2m &= 10 \quad (i) + 3 \\ 7n + 3m &= 29 \quad (ii) \times 2 \quad (1)\end{aligned}$$

$$\begin{aligned}15n + 6m &= 30 \\ 14n + 6m &= 58 \\ \hline n &= -28 \quad (1)\end{aligned}$$

$$5n + 2m = 10$$

$$5(-28) + 2m = 10 \quad (1)$$

$$-140 + 2m = 10$$

$$2m = 10 + 140$$

$$\frac{2m}{2} = \frac{150}{2} \quad (1)$$

$$m = 75 \quad (1)$$

$$\therefore n = -28 \text{ and } m = 75$$

(5 marks)

13. Betina has 42Kg of rice costing K640 per Kg. How many kilograms of rice costing K820 will she add in order to have a mixture costing K760 per Kg.

$$\begin{array}{r} 42 \times 640 = 27300 \\ + x \times 820 = 820x \\ \hline \end{array}$$

$$\text{Total cost } 42 + x = 820x + 27300 \quad (1)$$

$$\text{Average cost} = \frac{27300 + 820x}{42 + x}$$

$$(42+x) \times 760 = \frac{27300 + 820x}{(42+x)} \times (42+x) \quad (1)$$

$$27300 + 820x = 31920 + 760x$$

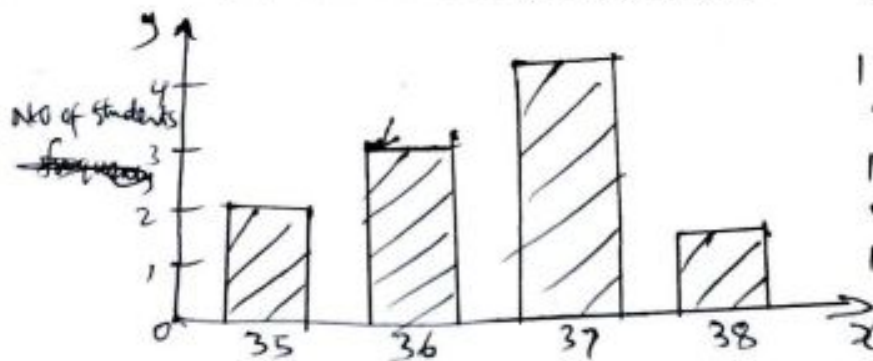
$$820x - 760x = 31920 - 27300 \quad (1)$$

14. In one Mathematics continuous assessment which was marked out of 40, the following marks were obtained by top ten performing students

37, 36, 37, 35, 37, 35, 37, 36, 38, 36

- (i) Draw a bar graph to illustrate the given information

(4 marks)



1 mark for correct labelling of axes
1 mark for correct scale on y-axis
1 mark for accuracy
1 mark for correct width of the bars

- (ii) Find the median for the given marks

(3 marks)

35, 35, 36, 36, 36, 37, 37, 37, 37, 38 (1)

$$\text{median} = \frac{36 + 37}{2} \quad (1)$$

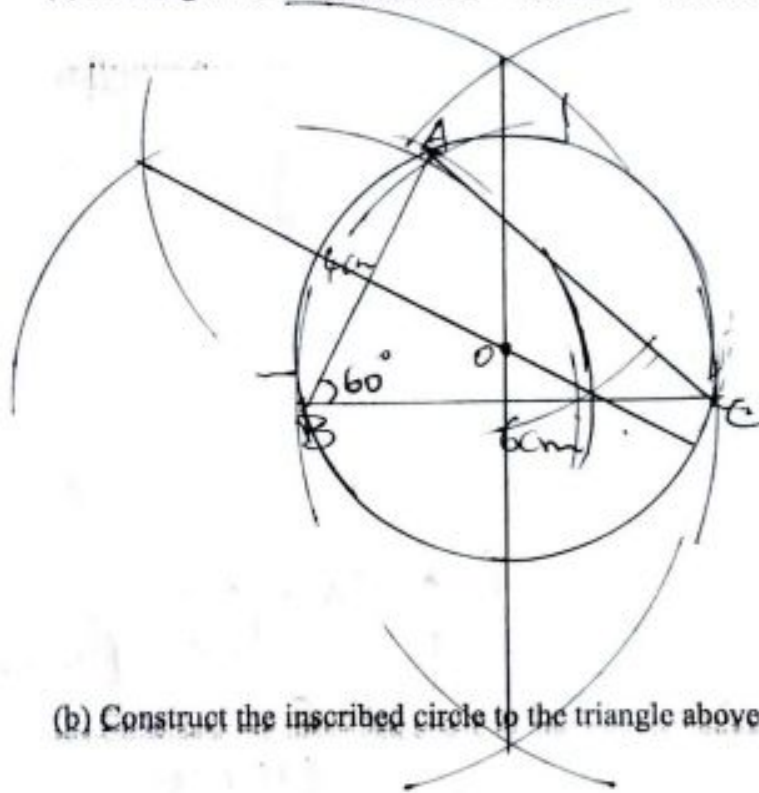
$$= \frac{73}{2}$$

$$= 36.5 \quad (1)$$

NAME: _____ SCHOOL: _____

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

(a) A triangle ABC such that $AB = 4\text{cm}$ $BC = 6\text{cm}$ and angle $ABC = 60^\circ$.



1 mark for correct arcs
1 mark for constructing
 60° angle correctly

1 mark correct perpendicular
bisector of Side AB

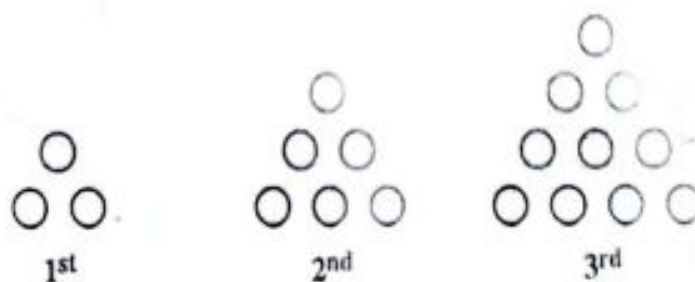
1 mark for correct perpendicular
bisector of Side BC

1 mark for correct locating
of locus point O

1 mark for correct inscribed
circle

(b) Construct the inscribed circle to the triangle above. (6 marks)

16. Figure below shows a pattern of marbles in a sequence. Calculate the number of marbles on the 10th term.



$$n^{\text{th}} \text{ term} = a + (n-1)d$$

$$a = 3, d = 3, n = 10 \quad (1)$$

$$\begin{aligned} 10^{\text{th}} \text{ term} &= 3 + (10-1)3 \quad (1) \\ &= 3 + 9 \times 3 \quad (1) \\ &= 3 + 27 \\ &= 40 \quad (1) \end{aligned}$$

17. Figure 4 shows a trapezium ABCD and a parallelogram ABCE

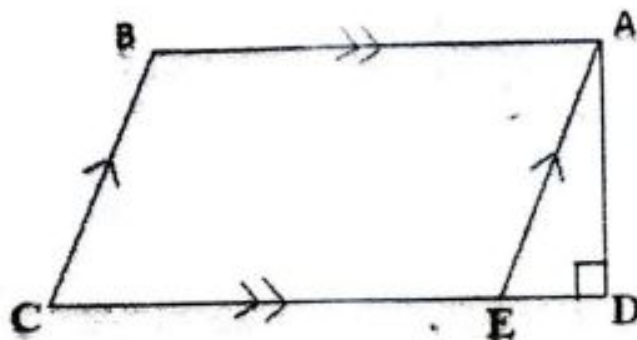


Figure 4

If side $AB = 6\text{ cm}$, $AD = 5\text{ cm}$ and $CD = 9\text{ cm}$, find the length of side AC

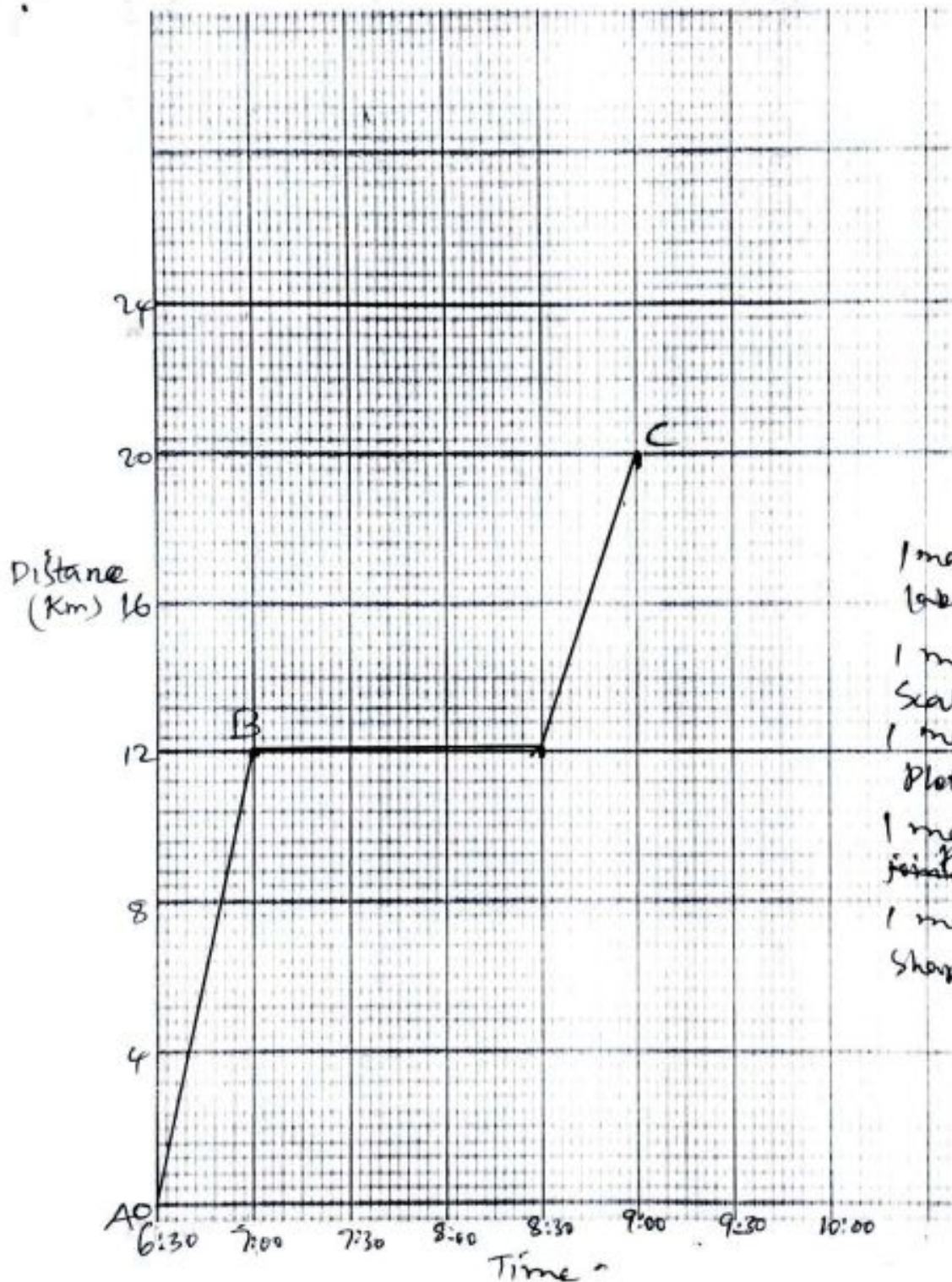
(5 marks)

$$\begin{aligned}
 ED &= 9 - 6 \\
 &= 3\text{ cm} \\
 AE^2 &= 5^2 + 3^2 \quad (\text{Pythagoras thm}) \\
 AE^2 &= 25 + 9 \\
 AE &= \sqrt{34} \\
 AE &= 5.8
 \end{aligned}$$

$$\begin{aligned}
 &\text{Consider } \triangle ACD \\
 AC^2 &= CD^2 + AD^2 \quad (\text{Pythagoras thm}) \\
 &= 9^2 + 5^2 \quad (1) \\
 &= 81 + 25 \quad (1) \\
 \sqrt{AC^2} &= \sqrt{106} \quad (1) \\
 AC &= 10.3\text{ cm} \quad (1)
 \end{aligned}$$

18. A cyclist left point A at 6:30 am for point C, which is 20 km away. At 7:00 am he stopped at point B for 1.5 hours having covered a distance of 12 km. He then continued at a speed of 16 km/h.

- a. Using a scale of 2 cm to represent 4 km on the vertical axis and 2 cm to represent 30 minutes on the horizontal axis, draw the distance-time graph for the cyclist. (5 marks)



1 mark for correct
labelling of axes

1 mark for correct
Scale

1 mark for correct
Plotting of the points

1 mark for correct
joining of the graph

1 mark for correct
Shape of the graph

b. Using your graph, find the time taken for the cyclist to reach his destination.

(3 marks)

Page 11 of 12

6:30am to 9:00am (1)

It took 2 hours 30 minutes (2)

19. The Volume of a cylinder is 3585 cm^3 . Given that its diameter is 15 cm , calculate the height of the cylinder (take $\pi = 3.14$) (4 marks)

$$\text{radius} = \frac{15}{2} \\ = 7.5 \text{ cm} \quad (1)$$

$$\text{Vol of cylinder} = \pi r^2 h$$

$$3585 = 3.14 \times 7.5 \times 7.5 \times h \quad (1)$$

$$\frac{3585}{176.625} = \frac{176.625 h}{176.625} \quad (1)$$

$$h = 20.3 \text{ cm} \quad (1)$$

20. A plastic bag has 9 blue sweets and 6 yellow sweets. A student picked a sweet at random from the bag. Calculate the probability that it is a yellow sweet. (4 marks)

$$P(\text{yellow sweet}) = \frac{\text{No. of fav. outcomes}}{\text{No. of poss. outcomes}} \quad (1)$$

$$= \frac{6}{15} \quad (2)$$

$$= \frac{2}{5} \quad (1)$$

END OF QUESTION PAPER

NB: This paper contains 12 printed pages