

EXAMINATION NO.: _____

NORTHERN EDUCATION DIVISION**2021 JUNIOR CERTIFICATE MOCK EXAMINATIONS****MATHEMATICS****Tuesday, 3 August, 2021****Time allowed: 2 hours****Instructions:**

1. This paper contains **12** pages. Please check
2. Answer all the **15** questions in section **A** and all the **5** questions in section **B**
3. The maximum number of marks for each answer is indicated against each question
4. Write your answer in the space provided for each question
5. Calculators maybe used
- 6. All working must be clearly shown**
7. Write your examination number on all pages of the question paper in the spaces provided
8. In the table provided on this page, tick against the question you have answered

Question Number	Tick If Answered	Do Not Write In These Columns	
1			
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Section A (70 Marks)**Answer All the 15 Questions in This Section**

1. Simplify $2xy - 4xy - 4yx$ (3 marks)

2.

a) Make p the subject of the formula $M = pt - w$ (3 marks)

(b) In **figure 1**, **BCD** is a straight line. **AB** is parallel to **CE**. Angle **ABC** = 32° and angle **BAC** = 60° .

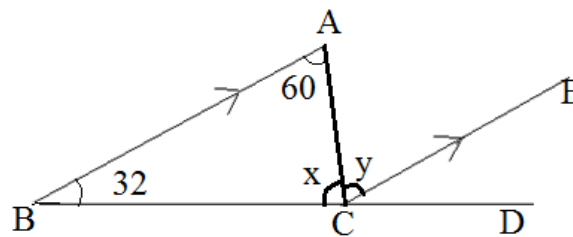


Figure 1

Calculate the value of angles x and y . (5 marks)

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3. Simplify $\frac{3d-9}{d^2-9}$ (4 marks)

4. Simplify $342_6 - 144_6$, giving your answer in base 10 (5 marks)

5. Zwede Dancers organized five performances. The following are numbers of people who attended each of their performances: 456, 480, 526, 550 and 498. To make profit, Zwede Dancers needed a mean attendance of 500 people per show. Work out whether Zwede Dancers made profit. (4 marks)

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6. Given the sequence 6, 9, 12, 15, ..., 120, calculate the number of terms. **(5 marks)**

7. Solve the equation $x^2 + 3x - 10 = 0$ **(6 marks)**

8. Copper of volume 100cm^3 and density 6.5g/cm^3 is mixed with aluminium of volume 110cm^3 and density 2.7g/cm^3 . Find the density of the mixture. **(5 marks)**

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9. Solve the equation: $\frac{x+5}{3x+7} = \frac{x-4}{3x}$ (4 marks)

10. A woman earns K100,000.00 per month. If income tax is calculated as follows:

0% in the first K30,000.00

15% in next K5 000.00

30% in excess of K35,000.00

How much is her monthly net income?

(5 marks)

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- 11.** A business person has bought a rectangular piece of land which measures 75m in length and 52m in width. How long is the diagonal of the piece of land?
(Correct your answer to one decimal place) **(4 marks)**
- 12.** Use the logarithms to evaluate $(56.42)^{\frac{1}{2}}$ giving your answer to 3 significant figures. **(5 marks)**
- 13.** Simplify $\frac{t^3k^3}{t^0k^{-3}}$ **(3 marks)**

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14. A regular polygon has an exterior angle of 30° . Find;

a) The size of its interior angle. **(2 marks)**

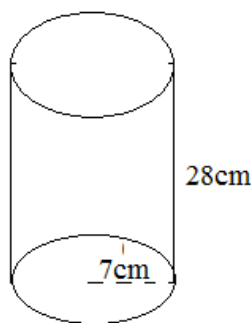
b) The number of sides of the polygon. **(3 marks)**

15. Solve the following inequality $5 - 2m \leq m - 1$ **(4 marks)**

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Section B (30 Marks)**Answer All the 5 Questions in This Section**

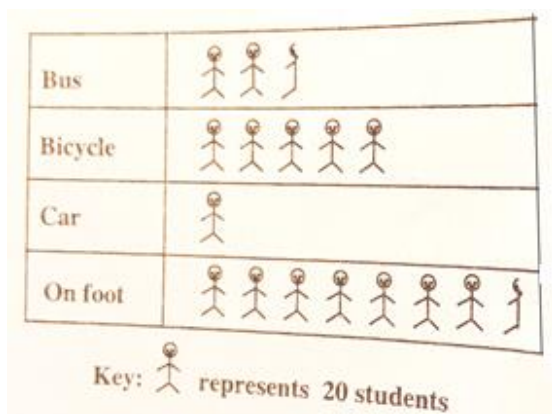
- 16. a) Figure 2** shows a cylinder with radius 7 cm and height 28 cm.

**Figure 2**

Calculate the volume of the cylinder. (Take $\pi = \frac{22}{7}$)

(3 marks)

- b) Figure 3** shows a pictograph representing means of travel used by students at a certain school.

**Figure 3**

If a student is picked at random, calculate the probability that the student's means of transport is bicycle.

(4 marks)

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17. In figure 4, AD is a mirror, angle $BAD = 75^\circ$.

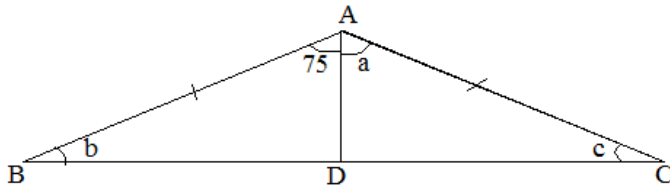


Figure 4

Use reflection properties to find the values of angles marked **a** and **b** (5 marks)

18. Using a ruler and a pair of compasses only

- (a) Construct triangle **RST** such that **RS = 6cm**, **ST = 7cm** and angle **RST = 60°**.
(b) Measure side and **RT**. (5 marks)

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19. In figure 5 **ABCD** is a parallelogram such that angle **DAB** = $(x + 23)$ and angle **ABC** = $(5x - 5)$

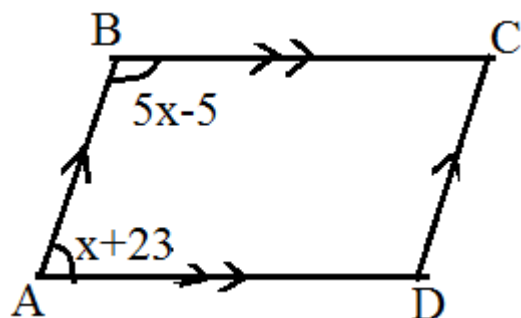


Figure 5

- (a) Find the value of x and hence the value of angle **BCD** (5 marks)

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- 20.** The tables below show the values of x and y for equations:
 $y = 5 - 3x$ and $y = 2x - 5$ respectively.

$$y = 5 - 3x$$

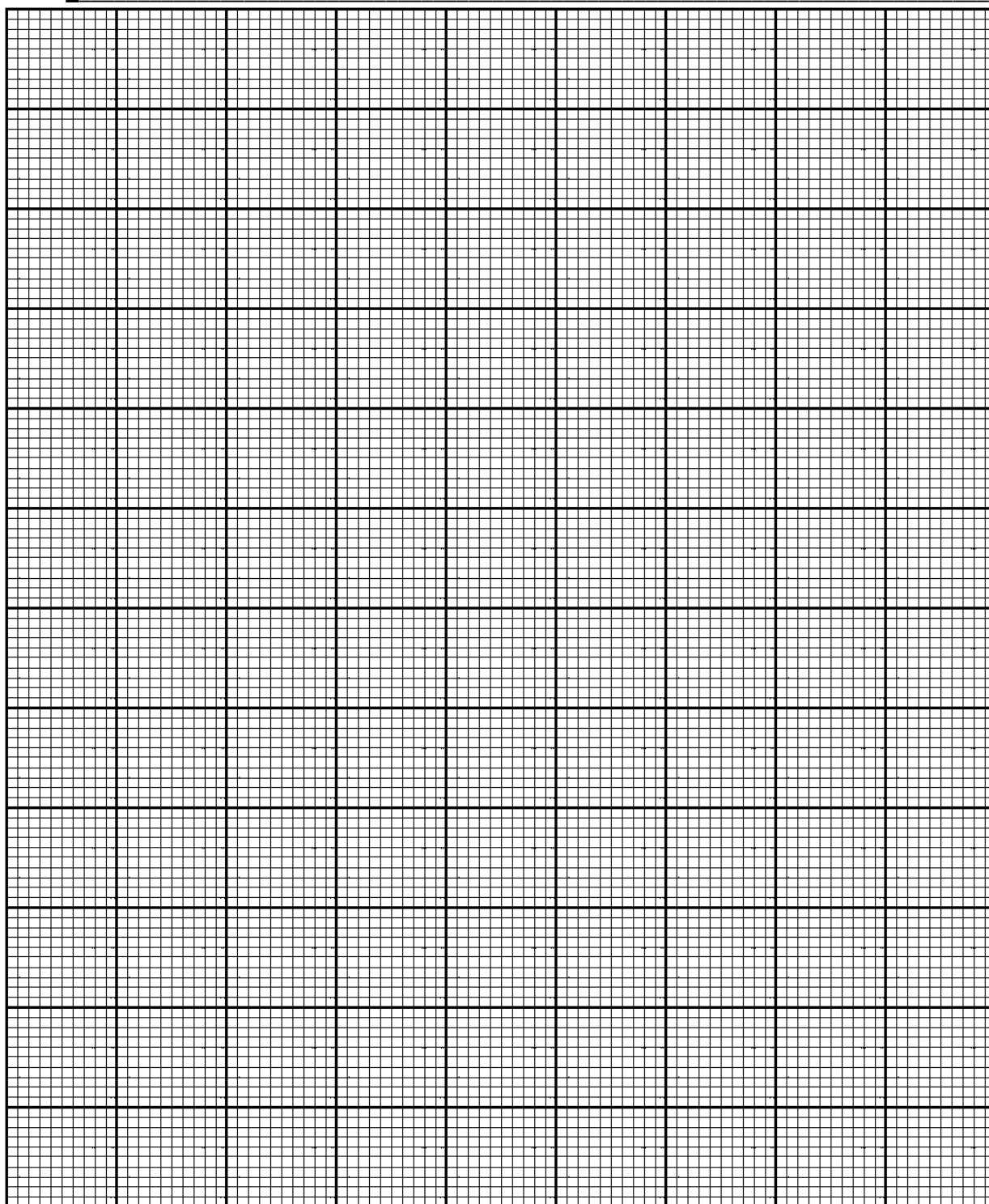
x	0	2	5
y	5	-1	-10

$$y = 2x - 5$$

x	-1	0	5
y		-5	

- a) Complete the table of values for the equation $y = 2x - 5$ **(2 marks)**
- b) Using a scale of 2 cm to represent 1 unit on the horizontal axis and 2 cm to represent 2 units on the vertical axis, draw the graphs of $y = 5 - 3x$ and $y = 2x - 5$ on the graph paper provided. **(4 marks)**
- c) Using the graphs in b), solve the simultaneous equations:
 $y = 5 - 3x$
 $y = 2x - 5$. **(2 marks)**

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END OF QUESTION PAPER

NB: THIS PAPER CONTAINS 12 PAGES