



Index Number:

NATIONAL CERTIFICATE OF EDUCATION

2023

MATHEMATICS (N510)

TIME: 2 HOURS

Candidates answer on the Question Paper.
Additional Materials: Geometrical Instruments

READ THESE INSTRUCTIONS FIRST

1. Write your index number in the space provided above.
2. Write in dark blue or black ink.
3. You may use an HB pencil for diagrams. Do not use correction fluid.
4. Diagrams are not drawn to scale unless otherwise specified.
5. Answer **ALL** questions.
6. All workings should be shown in the spaces provided.
7. This document consists of **31** questions printed on **20** pages, numbered **2** to **21**.
8. Calculators must **NOT** be used for this paper.
9. The number of marks is given in brackets [] at the end of each question or part question.
10. The total number of marks for this paper is **100**.

For Examiners' use													
Page No.	3	5	7	9	11	13	15	17	19	20	21	Total	Signature
Examiner													
Team Leader													
CE/ACE													

1. Work out:

$$\begin{array}{r} 451 \\ + 236 \\ \hline \\ \hline \end{array}$$

Answer: [1]

2. Evaluate:

$$\frac{8}{11} - \frac{5}{11}$$

Answer: [1]

3. Simplify $(a^4)^5$

Answer: [1]

4. Calculate 2.3×3

Answer: [1]

5. Evaluate: $2 + 5 - 4$

Answer: [1]

6. Circle all the **odd numbers** from the list below.

23 36 52 67 48

[1]

7. Express $\frac{27}{100}$ as a **decimal**.

Answer: [1]

8. (a) Simplify $4y + 9y$

Answer: [1]

(b) Factorise $2x + 4$

Answer: [1]

9. Write $2 \times 2 \times 2$ in **index form**.

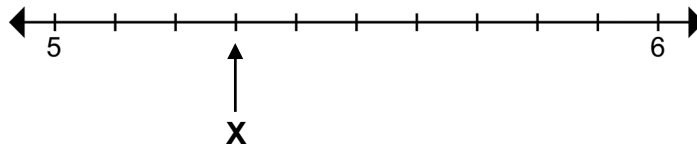
Answer: [1]

10. Find the Highest Common Factor (**H.C.F.**) of 15 and 25.

Answer: [1]

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11. Write down the value of **X**.



Answer: X = [1]

12. **Circle the correct answer. Each item carries 1 mark.**

- (a) How many sides does a **hexagon** have?

- A** 8
- B** 7
- C** 6
- D** 5

- (b) What is the value of **2** in 6231?

- A** 2000
- B** 200
- C** 20
- D** 2

- (c) Reduce $\frac{24}{30}$ to its **lowest terms**.

- A** $\frac{4}{5}$
- B** $\frac{8}{10}$
- C** $\frac{5}{6}$
- D** $\frac{12}{15}$

- (d) **One** mobile phone costs Rs 9 000.
What is the cost of 4 such mobile phones?

- A** Rs 3 600
B Rs 6 300
C Rs 36 000
D Rs 63 000



- (e) Which one of the following is a **square** number?

- A** 30
B 25
C 20
D 11

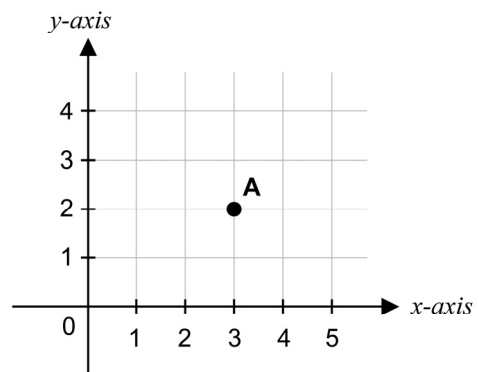
- (f) The **sum** of two numbers is 36. One of the numbers is 20.
What is the other number?

- A** 56
B 36
C 20
D 16

$$\begin{array}{r} 20 \\ + \square\square \\ \hline 36 \end{array}$$

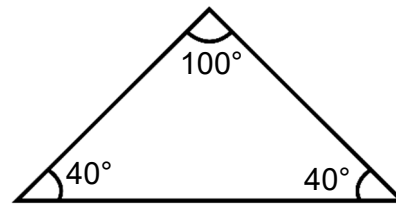
- (g) What are the coordinates of point **A**?

- A** (2 , 3)
B (0 , 3)
C (2 , 0)
D (3 , 2)



(h) What is the **sum** of the interior angles of a triangle?

- A** 360°
- B** 270°
- C** 180°
- D** 90°



13. Complete the sequence below.

3, 10, 17, 24,

[1]

14. Arrange the following numbers in **descending** order:

5213

5321

5132

5231

Answer: , , , [1]

15. Convert

(a) $7 \text{ kg} = \underline{\hspace{2cm}} \text{ g}$.

[1]

(b) $350 \text{ cm} = \underline{\hspace{2cm}} \text{ m}$.

[1]

16. (a) China is 4 hours **ahead** of Mauritius.

Complete the table below.

Time in Mauritius	Time in China
12 00	16 00
17 00

[1]

- (b) A car travels 90 km in 3 hours.
Find the **average speed** of the car.

Distance travelled	90 km
Time taken	3 hours
Average speed km/h

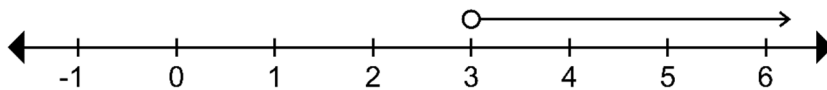
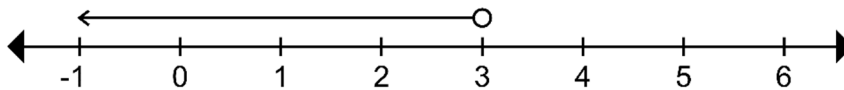
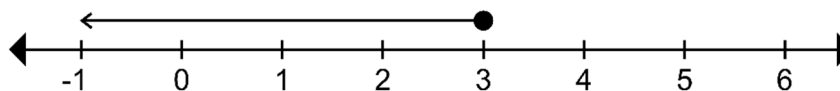
[2]

17. (a) Solve $x + 3 = 12$

Answer: $x =$ [1]

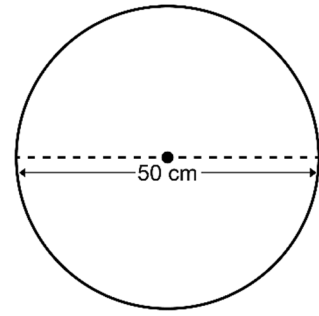
- (b) Which of the following number lines represents the **inequality** $x \leq 3$?

Tick (✓) the correct box.


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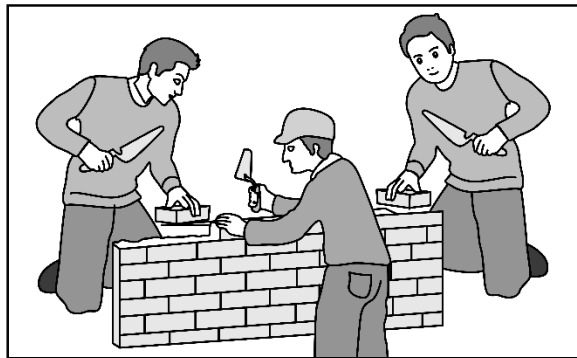
[1]

18. (a) The diameter of a circle is 50 cm.
Find its **radius**.



Answer:cm [2]

- (b) Three men take 18 days to build a wall.

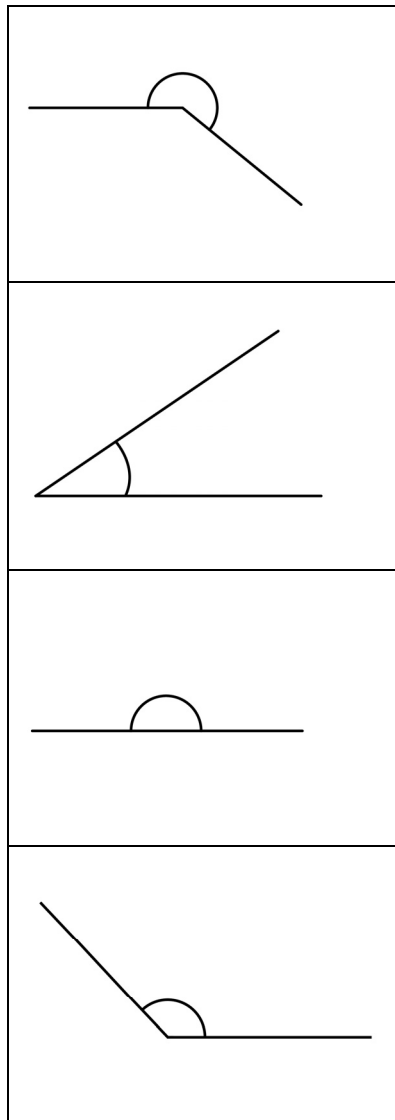


How many days will **one** man take to build the wall?

Answer: days [2]

19. (a) Match each type of angle in **column A** to its corresponding name in **column B**.

Column A

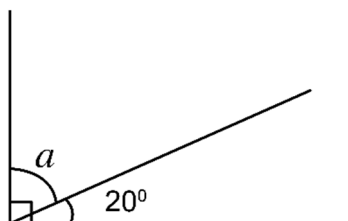


Column B

- Acute
- Straight
- Obtuse
- Reflex

[4]

- (b) Find **angle a** .



Answer: $a = \dots\dots\dots^{\circ}$ [2]

20. Given that:

$$\mathbf{A} = \begin{pmatrix} 1 \\ 7 \end{pmatrix}$$

$$\mathbf{B} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$$

Work out:

(a) $\mathbf{A} + \mathbf{B}$

Answer: [2]

(b) $\frac{1}{2} \mathbf{B}$

Answer: [2]

21. In the expression $4x + 1$, what is the **coefficient** of x ?

Answer: [1]

22. (a) Write 21.37 to 1 **decimal place**.

Answer: [1]

(b) Find $\sqrt{49}$

Answer: [1]

(c) $\frac{5}{8} - \frac{1}{4}$

Answer: [2]

(d) The equation of a straight line is $y = 2x + 5$.

(i) What is its **gradient**?

Circle the correct answer.

1 2 5

[1]

(ii) What are the coordinates of the **y-intercept**?

Tick (✓) the correct box.

(0 , 1)

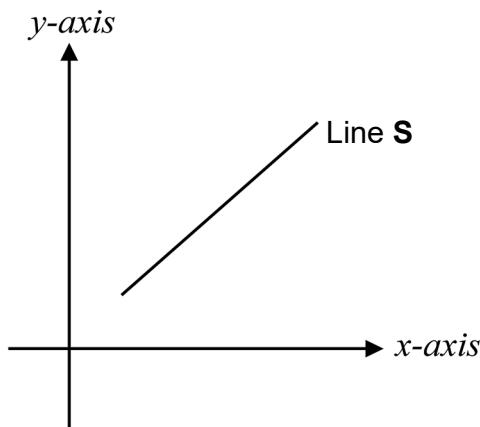
(0 , 2)

(0 , 5)

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[1]

(e) Study the graph below.



Complete the sentence.

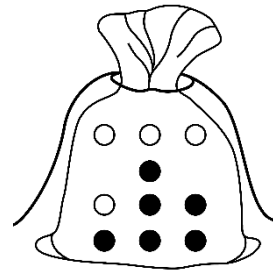
The gradient of Line **S** is _____ .

(negative zero positive)

[1]

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23. A bag contains 4 white marbles and 6 black marbles.
A marble is chosen at random.



Find the **probability** that it is

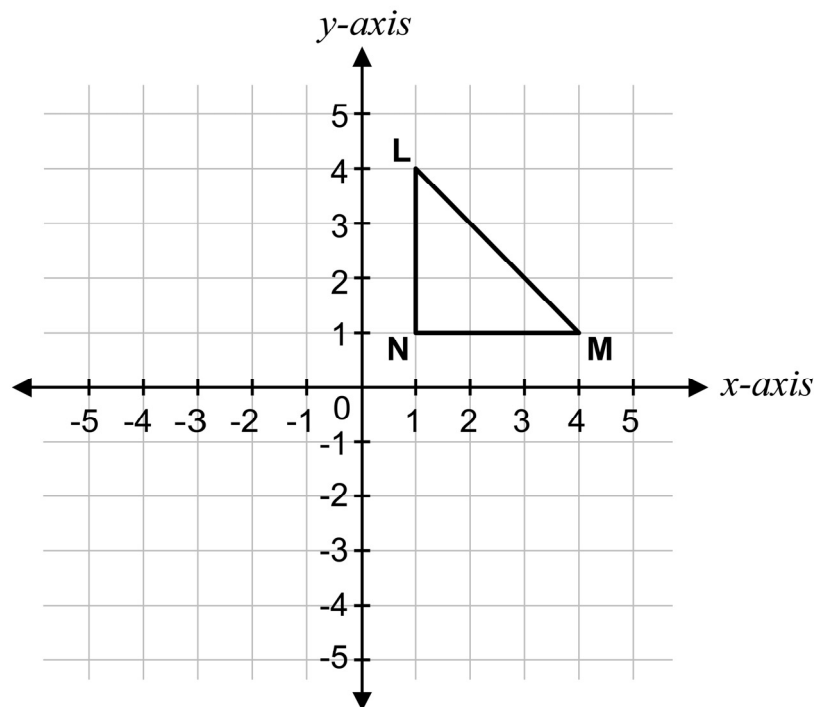
(a) black,

Answer: [1]

(b) red.

Answer: [1]

24. The graph below shows triangle **LMN**.



Draw the image of triangle **LMN** under a reflection in the *x*-axis.

[2]

25. (a) Factorise $x^2 + 11x + 10$.

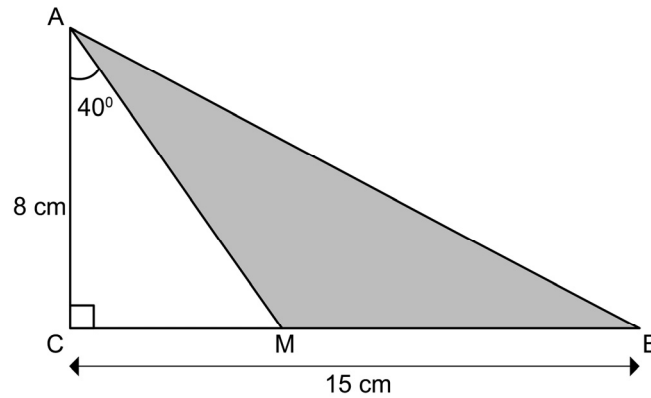
Answer: [2]

(b) Hence, solve the equation $x^2 + 11x + 10 = 0$

Answer: $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

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26. The diagram below shows a triangle ABC, where $BC = 15$ cm and $AC = 8$ cm. The point M lies on BC such that $\angle CAM = 40^\circ$.



- (a) Using the information given below, as necessary, find CM.

$[\sin 40^\circ = 0.64 \quad \cos 40^\circ = 0.77 \quad \tan 40^\circ = 0.84]$

Answer: cm [2]

- (b) Find the area of **shaded** triangle ABM.

Answer: cm^2 [3]

27. (a) Ali works for 6 hours daily from Monday to Friday. He is paid Rs 100 per hour.
- On Saturday, he works for 2 hours 45 minutes and is paid Rs 200 per hour.
- Calculate Ali's total earnings from Monday to Saturday.

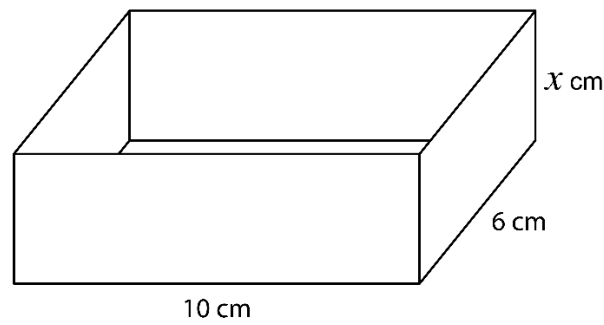
Answer: Rs [4]

- (b) Some marbles are shared among 3 children, Amy, Ben and Clara.
- Clara gets **half** of the marbles.
- Ben gets **twice** as many marbles as Amy.
- The information is represented on a **pie chart**.
- Find the **angle** that represents the number of marbles that Ben gets.

Answer: [3]

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28. The figure shows an **open** rectangular container **A**, of length 10 cm, width 6 cm and height x cm.



Container **A**

- (a) The **total surface area** of the container is 284 cm^2 .

Find its height x .

Answer: $x = \dots\dots\dots \text{ cm}$ [3]

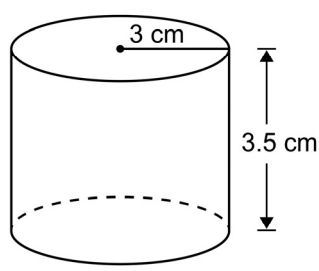
- (b) Using the value of x , obtained in part (a), find the **volume** of Container **A**.

Answer: $\dots\dots\dots \text{ cm}^3$ [2]

(c) A **cylindrical glass** has radius 3 cm and height 3.5 cm.

Calculate the volume of the cylindrical glass.

[Take $\pi = \frac{22}{7}$]



Answer: cm³ [2]

(d) 5 such cylindrical glasses are **completely** filled with water.

The water from these 5 cylindrical glasses is then poured into the open rectangular container **A**.

Find the volume of water that **overflows** from the container **A**.

Answer: cm³ [3]

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29. Ann invests Rs 125 000 in a bank that pays **simple interest** at the rate of 2.5% per annum.

After a few years, Ann withdraws **all** her money which amounts to Rs 137 500.

For how many **years** did Ann's money remain in bank?

Answer: years [3]

30. Solve the simultaneous equations:

$$4x - 5y = -7$$

$$6x + y = 15$$

Answer: $x = \dots\dots\dots$

$y = \dots\dots\dots$

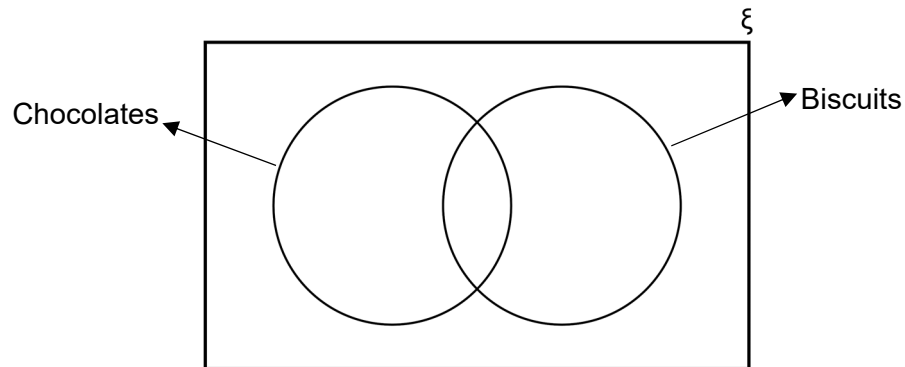
[4]

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31. (a) In a class, there are 36 students.
They are asked whether they like chocolates or biscuits.
Of the 36 students

- 20 like chocolates
- 18 like biscuits
- 6 like neither
- x like both

- (i) Represent the above information on the Venn diagram below.



[3]

- (ii) Find the **value** of x .

Answer: $x = \dots\dots\dots$ [2]

- (iii) How many students like **chocolates** only?

Answer: $\dots\dots\dots$ students [2]

(b) In a group of 75 children, the ratio of boys to girls is 3 : 2.

How many **more** girls must join the group so that the ratio of boys to girls becomes 5 : 4?

Answer: girls [5]

End of paper

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