

18.07.2023

Q - 8

Mathematics

First Term Test 2023

Grade 8

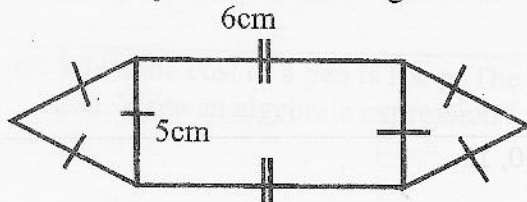
Time : 2 hours

Part I

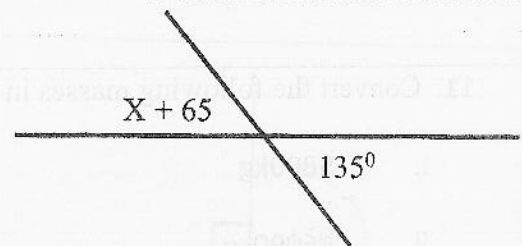
- Answer all the questions in this paper itself.

- Write the general term of the number pattern 7, 14, 21.

- Find the perimeter of the figure below



- Find the value represented by x in the figure below



- Write $6x + 4$ as a product of two factors.

- Find the 16th square number.

- A certain solid with simple edges has 9 faces and 9 vertices each. Find the number of edges of this solid.

7. 7t 5kg Express the mass in kilograms.

8. i) Write 64 as a product of prime factors.

ii) Find the value of $\sqrt{64}$

9. If $x = 3$, $y = (-2)$ then find the value of $5x - 2y$ by substitution.

10. Find the greatest common factor of the numbers 24, 30, 12.

11. Convert the following masses in kilograms to metric tons.

i. 5800kg

ii. 16090kg

12. Write Euler's relationship for solids.

13. $(+5) + (-3)$ Find the value using the number line.

14. The perimeter of a square wire frame is 36cm.

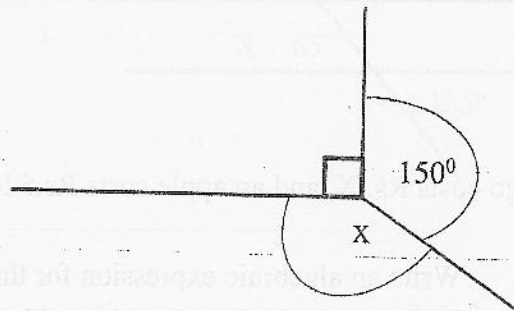
- i) Find the length of one of its sides.
- ii) Find the length of a side of an isosceles triangular wire frame with the same perimeter as the above rectangle.

15. Find the sum of all integers from 1 to 25.

16. Name two solids which contain only isosceles triangles as faces.

17. While the cost of a pen is Rs. p . The price of a book is 7 rupees more than five times the price of a pen. Write an algebraic expression for the price of a book.

18. Find the value of the angle represented by X .



19. Minimize and find value.

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

20. Express 32 as a power of 2.

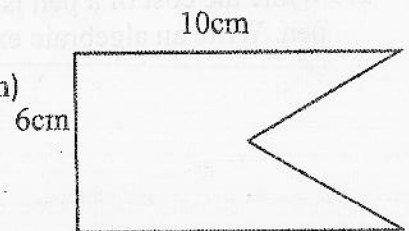
Part II

- Answer the first question and 4 more questions.

1.

- a) SpaceX is preparing to launch three weather satellites with a mass of 2t 800kg each with the help of a rocket. The total mass of the rocket with fuel is 12.5t.
- What is the total mass of the 3 satellites? (03 m)
 - Express the mass of the rocket with fuel in metric tons and kilograms. (02 m)
 - Find the total mass of the rocket including the fuel after including the three satellites. (03 m)
 - If the maximum mass that this rocket can safely launch is 20t, is this rocket safe to launch? Give reasons for your answer. (03 m)
- b) A logo is created using a rectangular plate measuring 10cm in length and 6cm in width. An isosceles triangle with a side length 6cm is cut out from the plate, as depicted in the figure below.

- Suggest a suitable geometric name to refer to this logo. (02 m)
- Find the perimeter of this logo. (03 m)



2.

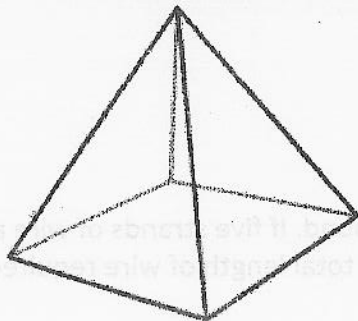
A mango costs Rs. X, and an apple costs Rs.5 less than three times the price of a mango.

- Write an algebraic expression for the price of an apple. (01 m)
- Write an algebraic expression with parentheses for the price of 5 apples. (02 m)
- Write and simplify an algebraic expression for the cost of buying 5 apples and 2 mangoes. (02 m)
- Find the total cost of buying 5 apples and 2 mangoes if the actual price of a mango is Rs.60. (02 m)

b) Write as a product of two factors.

- $6x - 12$ (02 m)
- $4a^2 + 6ab + 12a$ (02 m)

3. The base of the solid shown below is a square.



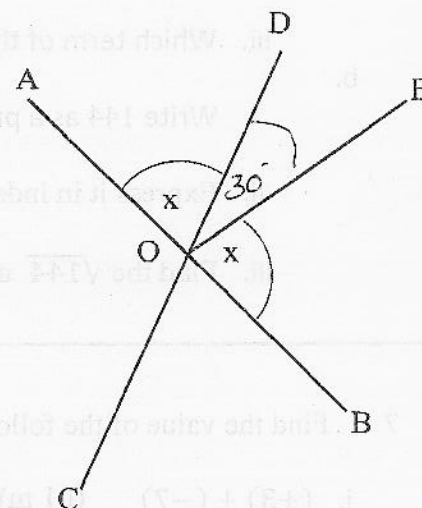
- i. Write a suitable name for this solid. (01 m)
- ii. Write the number of faces, vertices and edges of this solid separately. (03 m)
- iii. A new solid object was created by taking two such identical solids and pasting their rectangular supports to coincide. Suggest a suitable name for the new solid. (01 m)

- iv. Show that Euler's relationship is true for this new solid. (02 m)
- v. Certain solids are called Platonic solids. Explain what are Platonic solids. (02 m)
- vi. Write the names of four Platonic solids (02 m)

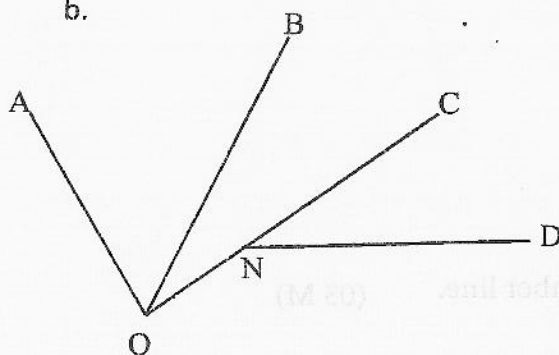
4.

a. AB and CD are two straight lines in the figure below.

- i. Name two pairs of vertically opposite angles. (02 m)
- ii. Name two pairs of supplementary angles. (02 m)
- iii. Find the value of x . (03 m)



b.



- i. Name a pair of adjacent angles shown in this figure. (02 m)
- ii. Are the angles $\angle BOC$ and $\angle CND$ adjacent? Give reasons for your answer (02 m)

5.

- a. The area of a square shaped playground is 900cm^2 .
- Find the length of a side of the playground. (03 m)
 - Find the perimeter of the playground. (02 m)
 - A wire fence is intended to be built around the playground. If five strands of wire are expected to be placed around the playground, find the total length of wire required. (03 m)
 - If it is intended to install wire posts at 3m intervals to support the construction of the fence, find the total number of wire posts required. (03 m)

6.

- a.
- Write the general term of the odd number pattern. (01 m)
 - Using the above general term, find the 12th odd number. (02 m)
 - Which term of the odd number pattern is 107? (02 m)
- b.
- Write 144 as a product of prime factors. (02 m)
 - Express it in index form. (02 m)
 - Find the $\sqrt{144}$ using prime factors or some other method. (02 m)

7. Find the value of the following expressions.

- $(+3) + (-7)$ (01 m)
- $(+3) + (-9) - (-5)$ (02 m)
- $(-12) \div (+4)$ (02 m)
- $\frac{(-4) \times (-9)}{(-3) \times (+2)}$ (03 m)
- Find the value of $(+3) - (-5)$ using the number line. (03 M)