MULATSI SECONDARY SCHOOL

END OF TERM TWO EXAMS 2024

MATHEMATICS S.2

DURATION:2HOURS.

INSTRUCTIONS TO THE CANDIDATES.

Attempt all the items.

Show all the necessary workings clearly.

Untidy work will lead to loss of marks.

Item 1

David an S2 learner has been tasked by the mathematics teacher to design a polygon that has seven sides. But not know the size of each angle that he should consider to do the work.

Because of the limited materials, ~~Daniel~~ has decided to borrow $\frac{1}{8}$ of the material, from his ~~brother~~ sister and $\frac{3}{4}$ from his brother and himself he will get the remaining length of the material which is 10m.

Task.

(a). Help Daniel to determine.

i) The size of each interior angle.

ii) The size of each exterior angle for the polygons he wants to make.

iii) Identify the polygon that he will make.

(b) (i) what fraction of the material will Daniel gets by himself.

ii). what is the total length of the material will Daniel use all together.

(c). If the cost of each length of 1metre of the material is shs, 2000, what do you think is the money Daniel will need all together.

Item two

Your head teacher recently realized that some subjects in the library do not have enough text books to use. He has decided that he buys some text books but the money available is shs, 1,255,000 for the purchase of the text books. He asked for the price and they told him that each text book costs shs, 20,000.

A fixed transport of shs, 55,000 will be needed.

Hint: Use knowledge of linear inequalities.

Task

(a). Help the head teacher to determine the maximum number of copies that he will be able to purchase (buy) using the money available.

(b). If he is allowed 10% discount at the shop, how much do you think he will spend all together on the text books.

Item three

In one village Abiria is a mother of three children. Namely Odama, Chandia and Leta. Using the relation" is a mother to ".She needs to present this information on an arrow diagram so that she can use it to explain the relation of her family to visitors who visit her at home.

The sum of Odama,s age and Chandia's age is 10 and the product of their a

Task

(a). Help Abiria to draw the arrow diagram to illustrate her family using the

b) What type of mapping does the relation represent?

i) Odama,s age

ii). Chandin,s age.

Item four

The school wants to set up a smail area where they will rear some birds for the project of agriculture. The mathematics teacher has given some directions to reach the place where the small area will be set up. From the school you move on a bearing 060^0 for a distance of 90m, then you change the direction and move on a bearing of 110^0 for a distance of 40m and then finally move due west for 20m.

The school wants to decide the room such that it is rectangular. They have brought 60m of the fencing material to cover only three sides and the other side they will set up a brick wall. The total area of this room they want to fence is $450m^2$.

Hint.

Use the knowledge of formulating quadratic equations.

Task.

Use a suitable scale to.

(a) Help the school and draw all the direction clearly guiding anyone who wants to reach the area where the birds will be reared from.

(b) If a person decided to use the direct route to reach the area for rearing the birds, what distance do you need to move?

(c) As a mathematics learner, advice the school on how to choose th length and the width of the room (area for the birds). Using the fencing material the school has.

END

No 1

9) (i) One interior angle $= \frac{(n-2)180}{n}$

$= \frac{(7-2)180}{7}$

$= \frac{5 \times 180}{7}$

$= 128.6°$

(ii) Each exterior angle $= \frac{360°}{7}$

$= 51.4°$

(iii) Heptagon or Septagon.

b) (i) Sister $= \frac{1}{8}$

Brother $= \frac{3}{4}$

Himself $= 10m$

$1 - \left(\frac{1}{8} + \frac{3}{4}\right)$

$1 - \left(\frac{7}{8}\right)$

$1 - \frac{7}{8}$

Remain $= \frac{1}{8}$

(ii) Let the total length be y

$\frac{1}{8} \times y = 10$

$y = 80\ m$

c) $1m = 2000$

$80m = 2000 \times 80$

$= 160,000$ (Total cost)

No 2

a) Available = 1,255,000 F
1 textbook = 20,000 F
Fixed transport = 55,000 F

~~total cost~~
Let the no of books be y.
$20{,}000y + 55000 \leq 1{,}255{,}000$
$20{,}000y \leq 1{,}255{,}000 - 55000$
$20{,}000y \leq 1{,}200{,}000$
$y \leq \frac{1{,}200{,}000}{20{,}000}$

$y \leq 60$

$y = \{60, 59, \ldots\}$

Maximum no of copies = 60 textbooks.

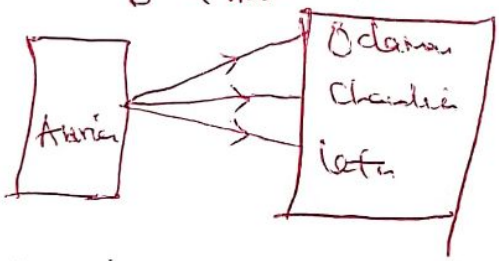
b) 10% discount on the textbooks
total cost on the textbooks
$= 20{,}000 \times 60 \times \frac{90}{100}$
$= 1{,}080{,}000$ F

total cost = 1,080,000 F

No 3

Children {Odama, Chedia, Leta}
mother {Abiria}
a) Relation is a mother to

"is a mother to"



b) ~~Many to One~~
One to many mapping.

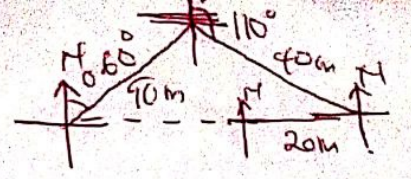
Odama's age + Chedia's age = 10
let x = y

$x + y = 10$
$xy = 21$
from (1) $x = 10 - y$

$-y^2 + 10y - 21 = 0$
$y^2 - 10y + 21 = 0$
$y^2 - 7y - 3y + 21 = 0$
$y(y-7) - 3(y-7) = 0$
$(y-3)(y-7) = 0$
$\Rightarrow y = 7$

Odama 3
Chedia 7

a)



School

Scale

Let 1cm : 10m

For 90m

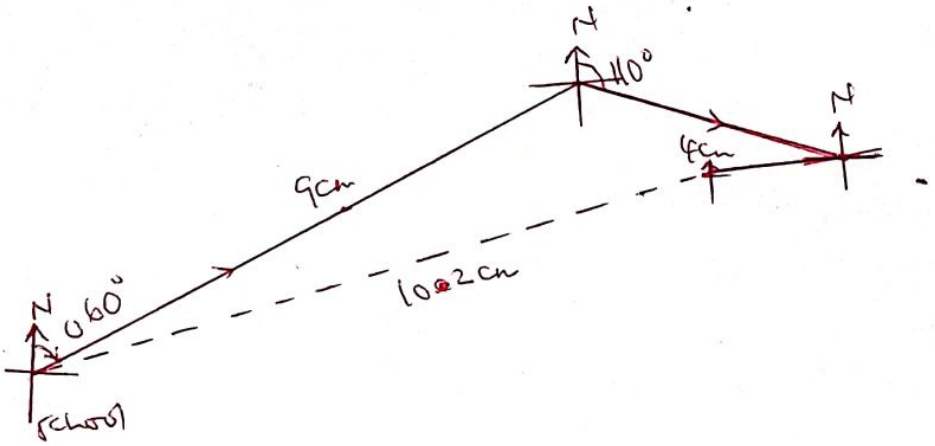
$\frac{90}{10} = 9cm$

For 40m

$\frac{40}{10} = 4cm$

For 20m

$\frac{20}{10} = 2cm$.

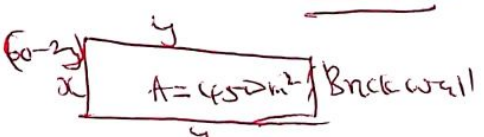


b) Direct route:

Distance = 10.2 × 10

= 102m

c) (i)



$x + 2y = 60$

$x = 60 - 2y$

$(60 - 2y)\, y = 450$

$60y - 2y^2 = 450$

$-2y^2 + 60y - 450 = 0$

$y^2 - 30y + 225 = 0$ (solve the quadratic equation)

$y = 15$ m

$x = 30$ m