THE DREAM EDUCATION CONCERN

"Quest for excellence"

PLACEMENT SET- PRIMARY SEVEN MATHEMATICS

OFFICIAL MARKING GUIDE

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FOR ALL EXAMINATIONS FROM BABY TO P.7

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TURN OVER

SECTION A (40 MARKS)

1	Write a set of members in your family who are 2cn tall. **Solution process** Let x = (members of my family who are 2cm tall) X = { } or $\varnothing$	2	Write 0.4927 in expanded form. **Solution process** 0.4927 = four tenths, nine hundredths, two thousandths and seven tens $=(4 \times \frac{1}{10})+(9 \times \frac{1}{100})+(2 \times \frac{1}{1000})+(7 \times \frac{1}{10,000})$ = 0.4 + 0.09 + 0.002 + 0.0007
3	Given that y = {2, 3, 5} find the number of subsets in y **Solution process** Formula for finding the number of subset = 2n Where n stands for number of elements n = (y) = 3 so number of subset = 2n = 23 = 2 x 2 x 2 = 8 subsets **Note:** where n= 3 and this is because set y has 3 elements or members	4	Okello bought a toy car at 120,000/= and sold it at 130,000/= express the profit as the fraction of buying price. **Solution process** Let's find the profit first Profit=selling price – buying price Profit = spx –bpx Selling price = 130,000 Buying price = 120,000 So the profit was = 130,000/= -120,000/= Profit = 10,000/= But we are told to express the profit as a fraction of the buying price Check below Profit = 10,000 Buying price = 120,000 $= \frac{10,000}{120,000} = \frac{1}{12}$ So the fraction of profit as buying price will be $\frac{1}{12}$
5	Convert 180km/hr to m/sec. **Solution process** 1km = 1000m 1hr = 3600sec Therefore, distance in meters Time in seconds (180 x 1000)	6	Write six thousand eight hundred twenty one in figures. **Solution process** We have to split the statement given according to place values and then express them in figures as shown below

(3600 x 1)sec
= 180,000
3600
= 50m/sec

Note: we had to multiply 180km by 100m to get 180,000
Then 180,000had to be divided by 3600 sec as above and the results were as written above which is 50m/sec

Periods	figures
Six thousand	6000
eight hundred	800
twenty one	21

we need to arrange vertically and sum them up as illustrated below

6,000
800
+ 21
6821

Therefore, our answer becomes 6821

Related content

Let's try to write our answer which is 6821in words

Note in order to write a given number in words we need to expand the given number according to the values of each digit

Expanded form	No in words
6,000	six thousand
800	eight hundred
20	twenty
1	one

Therefore, the above will be written as six thousand eight hundred twenty one

7 Work out the difference of 32,201 and 14,489.

Solution process

Arrange vertically as below

3 2 2 0 1 Note that difference
- 1 4 4 8 9 means subtraction

Note: That from (1-9) it's not possible so we shall be required to borrow.

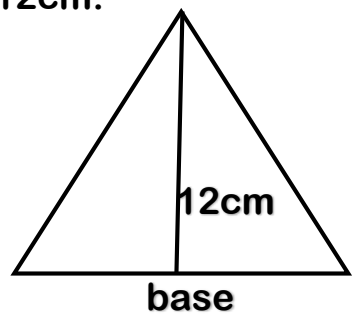
Re-arrange vertically as below

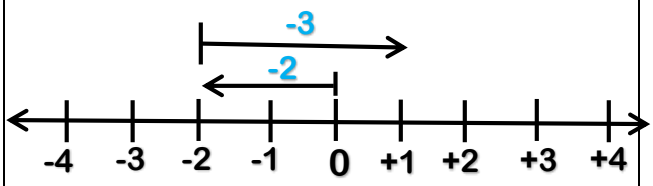
2 11 11 9 11
~~3 2 2 0 1~~
- 1 4 4 8 9

8 Given that y = {multiples of 5 greater than 10 but less than 45}. Find n{Y}

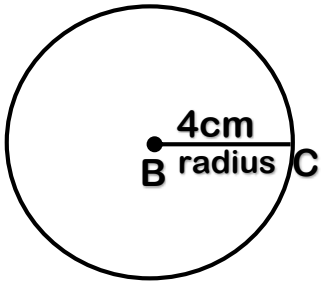
Solution process

1x5 = 5
2x5 = 10
3x5 = 15
4x5 = 20
5x5 = 25
6x5 = 30
7x5 = 35
8x5 = 40
9x5 = 45

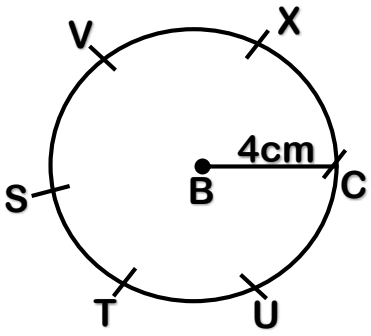
	1 7 7 1 2 Note: it's important to note that the amount you borrow from any place value column is equivalent to 10. As done above		10x5 =50 Y_5 = {5, 10, 15, 20, 25, 30, 35, 40, 45, 50….} Then Y= M_5 ={5, 20, 25, 30, 35, 40} n(Y) = 6
9	What fraction when multiplied by 6 gives $\frac{2}{3}$ as the product? Solution process If the fraction is , then 6 x M = $\frac{2}{3}$ Then let's divide each side by 6 as below 6M ÷ 6 = $\frac{2}{3}$ ÷ 6 = $\frac{6\,M}{6}$ = $\frac{2}{3}$ ÷ 6 M = $\frac{2}{3}$ ÷ 6 M = $\frac{2}{3}$ ÷ $\frac{6}{1}$ M = ($\frac{2}{3}$ x 3) ÷ (6 x 3) Multiply each fraction with the LCM of 3 and 1 which is 3 M = 2 ÷ 8 M = $\frac{2}{18}$ = $\frac{2\,x\,1}{2\,x\,9}$ = $\frac{1}{9}$ The fraction will be $\frac{1}{9}$	10	$\frac{3}{4}$ of my mother's age is 36. How old is my mother? Solution process Let the mother's age be T $\frac{3}{4}$ of T = 36yrs $\frac{3}{4}$ x T = 36yrs Multiply 4 by both sides as below 4 x $\frac{3\,T}{4}$ = 36yrs x 4 $\frac{4\,x\,3\,T}{\cancel{4}_1}$ = $\frac{\cancel{36}^{12}yrs\,x\,4}{\cancel{3}_1}$ $\frac{3T}{1}$ = $\frac{\cancel{36}yrs\,x\,4}{3}$ T = 12yrs x 4 = 48yrs So therefore mother's age is 48yrs
11	Find the base of a triangle below whose area is 60cm^2 and height is 12cm.  Solution process	12	Convert 0.25 as a percentage. Solution process 0.25 = $\frac{2\,5}{100}$ $\frac{25}{\cancel{100}_1}$ x $\frac{\cancel{100}}{1}$ = 25%

	Area = ½ x b x h Area = ½ x base x height $60cm^2$ = ½ x base x 12 $\frac{60cm}{6} = \frac{6b}{6}$ B = $10cm^2$ Note: Base = 2 x Area Height = 2 x Area The base of the figure alone a 10cm		
13	Work out $\bar{2} - \bar{3}$ using a number line. Solution process  	14	Simplify $4y^2 \times 3y^4$ Solution process $=4y^2 \times 3y^4$ $=(4 \times 3)\, y^2 \times y^4$ $= 12\,(y^2 + 4)$ $= 12y^6$
15	A sales man was paid a salary of sh. 10,000 plus a commission of 10% of the value of goods he sold worth sh. 6500. How much money did he earn? Solution process His salary = sh. 10,000 His commission = sh. $\frac{10}{100} \times 6500$ = sh. 10 x 65 =sh. 650 Total amount earned = (sh. 10,000 + 650) = 10,650 So the sales man earned sh. 10,650	16	Divide 9,832 by 8 using long division. Solution process 1229 8 | 9 8 3 2 1 x8 8 1 8 2 x8 - 1 6 2 3 2 x 8 - 1 6 7 2 9 x 8 - 7 2 - -
17	Draw a regular hexagon (6 sided polygon) of side 4cm. Soluton process Step 1 Draw a circle of radius 4cm. NB for a regular hexagon,	18	Nakato drove from town Z to town X at speed of 72km per hour. Town Z is 90km away from town Z. calculate the time she took to reach town Z. Solution process

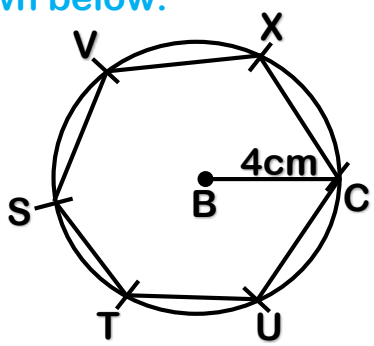
the length of side is equal to the radius (side = radius) as below



Step 2. Without changing the measurements of radius of the circle above, radius = BC), mark an arc on the circle and call it X from X mark another arc and continue all round marking points S, T and V as shown below



Step 3. Join arcs C to X to Y to S to T and U to C. this gives us a polygon of six sides called a hexagon (six sided polygon as shown below.



Method 1

$T = \frac{D}{S}$

Where T = time
D = distance
S = speed

Arrange as below

$\text{Time} = \frac{\text{distance}}{\text{Speed}}$

Where time = ? (un known)
Distance was 90km
Speed was 72km / hr

$\text{Time} = \frac{90}{72} = \frac{5}{4}$

$= 1\frac{1}{4}$hrs

Nakato took $1\frac{1}{4}$hrs to reach town Z.

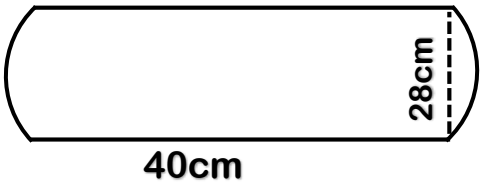
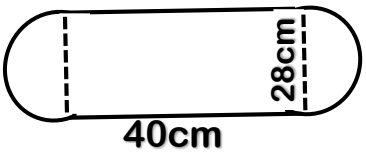
Method 2

S x T = D
Where S = speed
T = time
D = distance
Arrange as below for simplicity
S x T = D
72km x T = 90

$\frac{72T}{72} = \frac{90}{72}$

$= 5 \quad = 1\frac{1}{4}$hrs

So Nakato took $1\frac{1}{4}$hrs to reach town Z

19	**Find the area of the figure below.**  **Solution process** Since the figure has three parts we shall deal with each separately ie 2semi circles and one rectangle we are to find area of each shape separately and later sum them up as below  Area of a rectangle =length x width Area = L x W Area = (40 x 28)cm Area= 1120cm^2 Area of a semi-circle Diameter = $\frac{28}{2}$ Radius = 14 Area = $\frac{1}{2_1} \times \frac{22^{11}}{7_1} \times \frac{14^{2}}{1} \times 14$ Area = (1x 11 x 2 x 14) Area = 308cm^2 Area of two semi-circles = 308 x 2 Area of 2 semi-circles = 616cm^2 But we were told to look for area of the whole figure, so we shall sum up the area of 2 semi-circles and one rectangle as below.		

	Area of rectangle = $1120cm^2$ Area of 2 semi-circles = $616cm^2$ Arrange vertically 1 1 2 0 + 6 1 6 1 7 3 6cm^2 Total area of the figure above is 1736cm		

20 Change 1101 to denary base.

Solution process

1101 =(1 x 23) + (1 x 22) + (0 x21) +(1 x 20)

= 8 + 4 + 0 + 1

= 13ten

So denary means base ten

Related content the names of bases always confuse learners but the following key point can help our learners to remember

Key points to note about bases

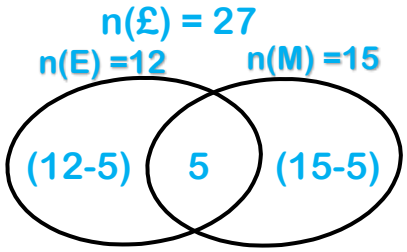
Base	Name	Digit used
Two	Binary	0, 1
Three	Ternary	0, 1, 2
Four	Quaternary	0, 1, 2, 3
Five	Quinary	0, 1, 2, 3, 4
Six	Senary	0, 1, 2, 3, 4, 5
Seven	Septenary	0, 1, 2, 3, 4, 5, 6
Eight	Octal	0, 1, 2, 3, 4, 5, 6, 7
Nine	Nonary	0, 1, 2, 3, 4, 5, 6, 7, 8
Ten	Denary / Decimal	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

SECTION B (60 MARKS)

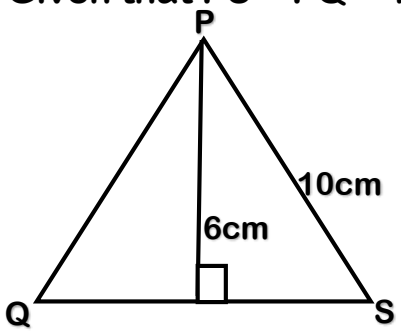
21 In a class, 12 pupils like English(E), 15 like Mathematic (M) and 5 pupils like both English and Mathematics

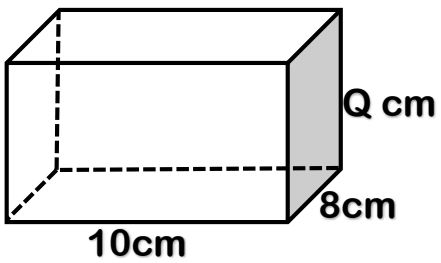
(a) Represent the above information on the Venn diagram

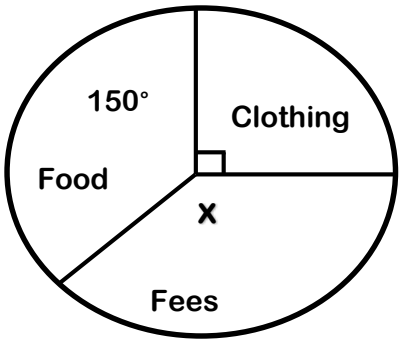
Solution process



	(b) How many pupils like mathematics only? (1mk) Solution process n(M) only = 15 – 5 M =10pupils (c) How many pupils like English only? (1mk) Solution process n(E) only = 12 – 5 E = 7pupils (d) How many pupils are in the class? (1mk) Solution process £ = 7 + 5 + 10 = 22pupils (e) Find the number of pupils who like only one subject. (1mk) Solution process n(M) only + n(E) only = (15 – 5) + (12 – 5) = 10 + 7 = 17 pupils like only one subject
22	A trader borrowed 400,000 from ABC bank at an interest rate of 5% per annum for six months. (a) Calculate the simple interest. (3mks) Solution process Simple interest = profit x time x rate $SI = P \times T \times \frac{R}{100}$ $SI = 400{,}000 \times \frac{6}{12} \times \frac{5}{100}$ $SI = \frac{4000 \times 5}{2}$ $SI = \frac{(20{,}000)}{2}$ SI = 10,000/= (b) What amount will the trader pay altogether? (2mks) Solution process Amount = principle + interest = 400,000 + 10,000

	= 410,000/= The trader would pay 410,000/=
23	Given that PS = PQ = 10cm, PR = 6cm and bisect <p.  Find the length QS. (3mks) Solution process PR = 6cm PS = 10cm RS^2 $=6^2$ 10^2 $RS^2 + 6 \times 6 = 10 \times 10$ $RS^2 + 36 = 100$ $RS + 36 - 36 = 100 - 36$ $=\sqrt{RS^2} = \sqrt{65}$ $=\sqrt{RS^2} = \sqrt{65}$ $=\sqrt{RS \times RS} = \sqrt{8 \times 8}$ RS = 8cm The length of QS = 8cm x 2 The length of QS = 16cm (b) Calculate the perimeter of the figure above. (1mk) Solution process Perimeter = sum of all sides P = sum of all sides P = 16cm + 10cm + 10cm P = 26cm + 10cm P = 36cm (c) Calculate the area of the figure above. (1mk) Solution process Area = (½ x base x height) Where area = (½bh) Base = 16cm Height = 6cm Area = $(\frac{1}{2}$ x base x height)

	Area = $\frac{1}{2}$ x 16cm x 6cm Area = 8cm x 6cm Area = $48cm^2$
24	12 women can weed the garden of groundnuts in5days. (a) How many women are needed to do the whole job in one day? (3mks) Solution process 5days requires 12 women 1day requires 12 x 5 Note: Since we need more women, we shall multiply the given number of women by 5 days as shown below. (12 x 5) =60 women 60 women are needed to do the whole job in only one day (b) How long will 10 women take to do the same job? (2mks) Solution process 12women take 5 days 1woman take (12 x 5) days 10women take $(\frac{\cancel{5}^{1} \times \cancel{12}^{6}}{\cancel{10}})$ = 6 days 10 women will take 6 days to do the job
25	The angle sum of length of the all edge of the prism below is 96cm. study it and answer the questions.  (a) Find the edge Q. (3mks) Solution process Length, mass and capacity 4Q = 96 – (10 x 4) + (8 x4) 4Q = 96 – (40 + 32) 4Q = 96 – 72

	4Q = 24 Let us divide both sides with the figure which has the un known as shown below $\frac{4Q}{4} = \frac{24}{4}$ Q = 6cm So Q is equal to 6cm **(b) Calculate the volume of the prism.** **(2mks)** **Solution process** Volume = base are x height V = 10cm x 8cm x 6cm $V = 480cm^3$ Note: Since we multiplied 3 dimensions, we have no reason to ask why we have put $cm^{(3)}$/ a three on top of our final answer
26	**Akiteng Christine spends her salary as below by the pie chat. If she earns sh.180,000 per month, use the pie chat to answer the following questions.**  **(a) Find the value of X.** **(2mks)** **Solution process** According to the appearance of the pie chat, clothing are located on 90° as shown above physically, So we shall borrow that angle to manage our calculation as below X + 90° + 150 = 360° We have equated to 360° because a circle adds up to 360° X + 90° + 150° = 360° X + 250° = 360° X + 240 – 240 = 360° - 240 We have subtracted 240 from 360° because it has crossed the equal sign and become Negative check below

X + ~~240~~ – ~~240~~ = 360° - 240°

We cross the positive and negative values to make our mathematical statement more easier

X = 120°

(b) How much does she spend on fees? (2mks)

Solution process

Since we have got 120° as value for fees, let's now substitute as below

Value of X (Fees) $\longrightarrow \frac{(120° \times 180{,}000)}{360°}$ actual salary

The value of the whole pie chat being a circle check below

$\frac{120°}{360°} \times 180{,}000$

$120° \times 180{,}000$

$360°$

$\frac{(21600{,}000)}{360}$

= 60,000/=

She spends 60,000/= on fees

(c) Express the expenditure on food as a fraction of the total. (1mk)

Solution process

$\frac{150°}{360°}$ which is the portion for food which is the value of the circle

$\frac{\cancel{150}^{5}}{\cancel{360}_{12}}$

$= {}^{5}/_{12}$

The expenditure on food as a fraction of the total will be ${}^{5}/_{12}$

27 The table below shows the results of an English exam at Divine nursery and primary school in primary seven class. Use it to answer the questions that follow

Scores	80	70	60	12	30	40
Frequency	1	2	3	1	2	5

(a) Find the modal mark. (1mk)

Solution process

Modal mark means the number whose value has appeared many times so far this case 40 appeared five times yet the rest were below

So the modal mark was 40

(b) Find the modal frequency. (1mk)

Solution process

	Modal frequency means the number of times the commonest figure / number has appeared so far this case. 40 was the modal mark and it appeared 5 times yet the rest were below so the modal frequency was 5 **(c) Calculate the mean. (2mks)** **Solution process** Mean = sum of elements No of class $\text{Mean} = \frac{80 + 12 + (70 \times 2) + (60 \times 3) + (30 \times 2) (40 \times 5)}{14}$ $\text{Mean} = \frac{(80 + 12 + 140 + 180 + 60 + 200)}{14}$ $\text{Mean} = \frac{(672)}{14}$ Mean = 48
28	**Wamono bought 120 goats at sh. 120 per goat, 30 sheep at sh.400 each. He later sold each goat at sh.150and each sheep at sh.500. Calculate the percentage profit Wamono got. (5mks)** **Solution process** **Cost of goats** Sh.120 x 120 Sh.14400 **Cost of sheep** 400 x 300 Sh.12000 **Total cost of two items** Sh.14400 + sh.12000 Arrange vertically as below 14400 + 12000 Sh.26400 **Profit on goats** sh.120 (150 – 120) sh. = 30 Sh.120 x sh.30 = sh.3600 So profit on goats was sh.3600 **Profit on sheep** 30 x (500 – 400) sh. To get the above properly, we shall use the formula of finding profit as below Profit = selling price – buying price

P = spx – bpx
P = (500 – 400) sh.
P = (100) sh.
So profit on sheep was sh.100
So to get the total profit on sheep we shall use the formula below

30 x 100
↓ ↓
Sheep the profit per sheep
Bought

Profit on sheep = sh.300
So total profit will equal to summation of profit on goats and sheep as below
Profit on goats = sh.3600
Profit on sheep = sh.300
Total profit will equal to

Sh.3600
+sh. 300
Sh.6600

But we are looking for percentage profit
To get the percentage we shall equate total profit divided by total cost of all the two items as below and multiplied by 100%
Total profit = sh.6600
Total cos of all the items = sh.26400
Check below

$\frac{Sh.6600}{26400} \times 100\%$

= 25%
Wamono got a percentage profit of 25%

29 **Wagonero sent Stephen to Mawotto with 10,000 after buying all the items shown on the table, he remained with 200/=. Study the table below and answer the questions that follow.** **(6mks)**

Items	Quality	Price per kg	Amount spent
Millet	4 kg	Sh.700	Sh.2800
Rice	2kg	Sh.1500	Sh. 300
Maize flour	3 kg	Sh.600	Sh.1800
Cow peas	2kg	Sh. 1100	Sh. 2200
		Total	sh. 9800

(a) Complete the above by showing your working

Step 1. Millet

To find the quantity of millet, we shall use the formula below.
Converting a bigger unit to a smaller unit, we shall divide
Check below
Price per kg of millet = 700
Amount spent on millet = 2800

~~2800~~ 4
~~700~~ 1

Millet was 4kg

Step 2. How much was spent on rice
To find the amount spent on rice, we shall multiply since when changing a bigger unit to a small unit
Check below
Quantity = 2kg
Price per kg = 1500/=

1500
x 2
sh.3000

Step 3. Maize flour
To find the quantity of maize flour, we shall divide since changing a smaller unit to a big unit, we divide
Check below
Price of maize flour per kg =600/=
Price amount of maize flour = 1800

~~1800~~ 3
~~600~~ 1

Step 4. To find the total spent on cow peas, we shall sum up all the expenditure not forgetting that we do not have the cost of cow peas per kg as below

Items	cost
Millet	2800/=
Rice	3000/=
Maize flour	1800/=
Cow peas	Y?
	7,600Y

Note: Y stands for the cost of cow peas which we do not know yet. So the amount spent of cow peas will be obtained by adding all the total cost to the balance which he came back with which was sh.200 and subtract from the original amount he went with to the market which was 10,000/=
Check below

Total cost of all items = 7600/=
Balance left was 200/=
Arrange vertically

```
  7600/=
+ 200/=
 7800/=
```

So to get the exact amount which was spent on cow peas, we shall subtract total cost including balance that remained from the original amount.
Check below
Total cost and balance = 7800
Original cost = 10,000
Arrange vertically while the bigger value on top and the smaller one down to avoid negative values as below

```
 10,000
-  7800
  2200
```

So sh. 2200 was spent on cow peas, but remember we had 2kg of cow peas. So we shall divide total cost of peas divided by 2 which if the quantity
Check below.

```
2200
  2      = 1100/=
```

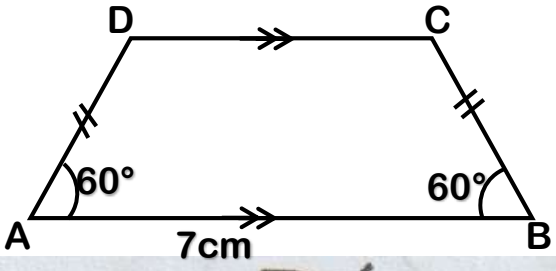
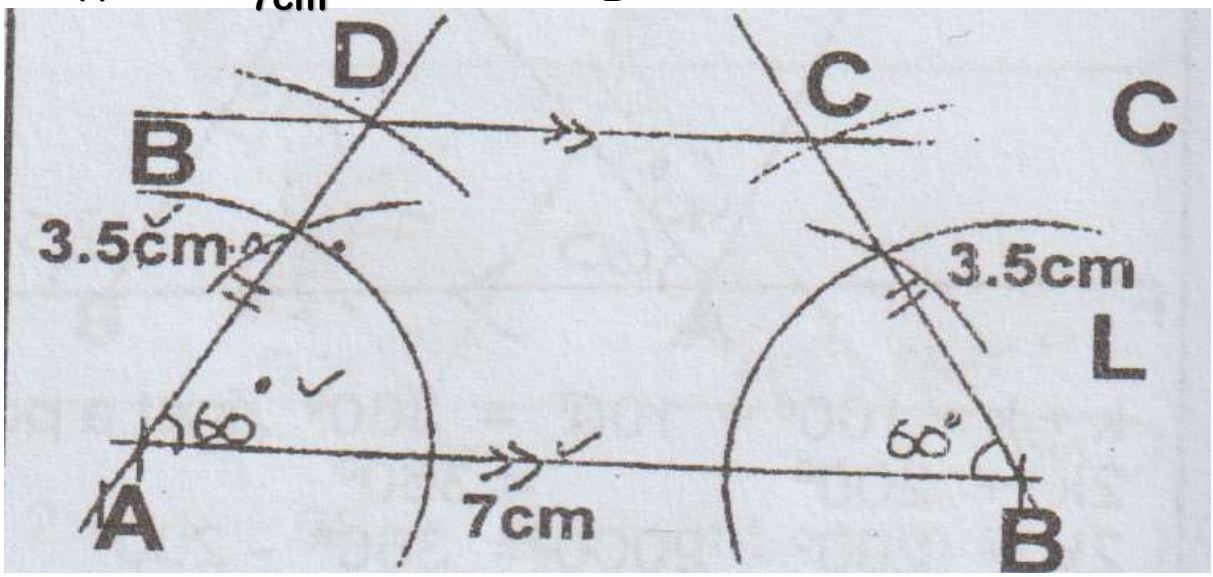
Step 5. To find the total amount spent of all items, we shall add all the amount all the items bought check below

Items	cost
Millet	2800/=
Rice	3000/=
Maize flour	1800/=
Cow peas	2200/=

Sh.9800
Let's prove our answer below
(i) Added cost of all items 9800/=
(ii) The balance which was left 200/=
Arrange vertically for proper addition as below

```
 Sh. 9800
+sh.  200
 Sh. 10,000
```

So our answer stands to be correct, since what was spent was sh.9800. And our balance was sh. 200. Then if summed up, it gives the sh.10,000 which he originally wen with to the market

30	**Using a ruler, pencil and a pair of compasses only, construct a quadrilateral ABCD where line AB = 7cm and angle ABC = BDA = 60° and AD = BC = 3.5cm.** **Solution process** **Sketch**   **(b) Measure length DC.** **Solution process** **DC = (3.5 ± 0.1) cm**
31	**Work out** $\frac{2.7 \times 4.8}{2.4 \times 3.6}$ **Solution process** **Convert decimal number to fractions as below** $\frac{27}{10} \times \frac{48}{10}$ $\frac{24}{10} \times \frac{36}{10}$ $\frac{27}{10} \times \frac{48}{10} \div \frac{24}{10} \times \frac{36}{10}$ $= 27 \times \frac{\cancel{48}^{2}}{\cancel{24}_{1}} \times \frac{1}{\cancel{100}_{1}} = \frac{27 \times 2 \times 1}{36} = \frac{54}{36}$

	$= \frac{3 \times 2}{4} = \frac{3}{2}$ $= 1\frac{1}{2}$ **(b) Simplify $1\frac{1}{6} \times 1\frac{1}{7} \div 2\frac{1}{3}$ (2 marks)** **Solution process** Change the mixed fraction to improper fraction as using the formular below $\frac{D \times W \times N}{D} \times \frac{D \times W + N}{D} \div \frac{D \times W + N}{D}$ Where D stands for Denominator W stands for Whole number N stands for Numerator But our task is as written below $= 1\frac{1}{6} \times 1\frac{1}{7} \div 2\frac{1}{3}$ $\frac{6 \times 1 + 1}{6} \times \frac{7 \times 1 + 1}{7} \div \frac{3 \times 2 + 1}{3}$ $\frac{7}{6} \times \frac{8}{7} \div \frac{7}{3}$ Let us change the division sign to multiplication sign not forgetting that as sign changes, the reciprocal must take plus as below. $\frac{7}{6} \times \frac{8}{7} \times \frac{3}{7}$ We are going to council as we divide the above mathematical statement as below $\frac{\cancel{1}}{\cancel{6}_{\cancel{2}_{1}}} \times \frac{\cancel{8}^{4}}{\cancel{7}} \times \frac{\cancel{3}^{1}}{7} = \frac{4}{7}$ $= \frac{4}{7}$
32	**The number of goats, cows and sheep in Namukose's farm are in a ratio of 4 : 3 : 5 respectively. There are 40 more sheep than goats. Calculate the number of each type of animal on the farm.** **Solution process** **Note:** The word "respectively" means that ratios are for the items following the order meaning the first ratio goes with the first item and continues currently as symbolically below Goats : Cows : Sheep 4 : 3 : 5

G : C : S
4 : 3 : 5
Note: Now part of animal given was 40. let's first sum up the ration to get its total
G : 4
C : 3
S : 5
12 (Total ratio for all the three groups of animals.
1part – 40animals
Goat 4 x 40 = 160goats
Cows 3 x 40 = 120cows
Sheep 5 x 40 = 200sheep
480 total animals

Method 2

(i) Goats = $\frac{4}{12_3} \times 480 = \frac{480}{3}$

Goats were 160

(ii) Cows = $\frac{3}{12_4} \times 480 = \frac{480}{4}$

Cows were 120

(iii) Sheep = $\frac{5}{12} \times 480 = \frac{2400^{200}}{12_1}$

Sheep were 200