**PRIMARY SEVEN MATHEMATICS LESSON NOTES TERM II**

**WEEK**

**THEME : NUMERACY**

**TOPIC : FRACTIONS**

**SUB-TOPIC / CONTENT : DECIMAL FRACTIONS**

**TEACHING / LEARNING ACTIVITIES: Fractions as decimals and decimals as fractions.**

**NOTES : RECURRING DECIMALS TO COMMON FRACTIONS**

**NON-RECURRING DECIMALS**

Express as decimals

0.75

a. 4 3

D N 0 X 4 - 0 = 0.75

30

7 X 4 - 28

20

5 X 4 - 20

00

b. Re-curing as a decimal.

0.66

3 2

0 x3 – 0

20

6 x 3 - 18

20

6 x 3 – 18

2

D N = 0.66 …

c.

0.7272

11 8

0 x11 – 0

80

7 x 11 - 77

30

2 x 11 – 22

80

7 x 11 -77

30

2 x 11 - 22

8

D N = 0.7272

Express recurring decimals as fractions.

a. 0.666 …

x = 0.666… i multiply both

10 x = 6.666 … ii sides by 10

Subtract (i) from (ii)

10 x = 6.666…

- x = 0.666…

9 x = 6.000

9 x = 6

9 9

9 = 6 2

9 3

X =

b. 0.7272 …

x = 0.7272 … (i) multiply by 100

100 x = 72.7272 … (ii)

Subtract (i) from (ii)

100 x = 72.7272

- x = 0.7272

99 x = 72.0000

99 x = 72

99x = 72 8

99 = 99 11

X =

**Exercise**

**Convert to decimal fractions**

a. b. c. d. e.

Convert to rational fractions

a. 0.444… b. 0.5454…. c. 2.99… d. 0.366

e. 0.123123

**References**

1. **Fountain Primary Maths bk 7 pg 76 – 78**
2. **Mk Maths bk 7 pg 89 – 91**
3. **Primary 7 curriculum pg 150**
4. **Understanding maths bk 7 pg 63 – 64**
5. **New Mk Pr. Maths pg 58 – 59**

**MIXED OPERATIONS IN DECIMALS**

**NOTES: ADDITION AND SUBTRACTION**

Work out:

1. 69.5 – 0.03 + 1.006 BODMAS

1.006 + 69.5 – 0.03

Add first then subtract

1. 006 70.506

+ 69.500 - 0.030

70.506 70.476

2. 5.05 + 4 – 2.36 + 1.0275

BODMAS

Add first then subtract

5.0500 10.0775

4.0000 - 2.3600

+ 1.0275 7.7175

10.0775

**Exercise**

1. 8.42 - 0.759 + 4.02
2. 3.9272 – 0.902 + 8
3. 63.58 – 8.7 + 1.026
4. 9.05 + 1.11024 – 3.68 + 0.998
5. 6.73 + 12.6 – 0.072

**Reference**

1. Fountain primary maths bk 7 pg 29
2. Mk pri. Maths bk 7 pg 81
3. Pr. Level supplementary Maths 8 pg 27

**MULTIPLICATION AND DIVISION**

Notes:

4.6 x 2.1

46 x 21 46

10 10 x 21

966 46

100 + 92

9.66 966

Multiply

4.6 x 2.1

4 . 6

x 2 . 1

4 6

+ 9 2

9 . 66

1.

2. Divide (work out) 3. Simplify

3 . 6 x 2 . 9 = 36 x 29 ÷ 58

5 . 8 10 10 10

18

36 x 29 x 10

10 10 58

29

18 x 1 x 1

10

1.8 = 1.8

10

172 ÷ 0.02

172 ÷ 2

100

8 6

17.2 x 100

2

86 x 100

= 8600

4.

0.36 0.27

+ 0.12 - 0.11

0.48 0.16

() ÷ ()

x

=3 x 1

= 3

Exercise . (work out)

1. 2 . 1 x 0.5
2. 4 . 5 x 2. 65
3. 2.004 ÷ 6
4. 1.32 ÷ 9.6

**Reference**

**Pr. Level supplementary maths 8 pg 28 – 29**

**Mk maths bk 7 pg 83 – 86**

**Fountain primary mathematics bk 7 pg 29 – 31**

**Revision maths for upper pr. Pg 52 – 53**

**PROPORTIONS / RATIOS**

**Learning area : - Recognize people involved**

* **Identify ratio of items involved**

**Sharing in ratios**

Notes : Given total

1200kg of meat was shared in the ratio 5: 7 by A and B respectively.

How much meat did each get?

TOTAL OF RATIO – 5 + 7 = 12

A’s share B’s share

100

5 x 1200 kg

12

= 500 kg

100

7 x 1200 kg

12

= 700 kg

P and Q share a sum of money in the ratio of 5 : 7 respectively. If P gets shs. 4800.

a) How much does Q get?

|  |  |  |
| --- | --- | --- |
| P | Q | T.T |
| 5p | 7p | 12p |
| Sh. 4800 |  |  |

960

x 12

1920 + 960

11520

12parts

12 x sh 960

= sh 11520

5p = sh 4800

960

1p = sh 4800

5

P = sh 960

Q gets 7 parts

960

x 7

6720

7 x sh 960

= sh 6720

b. How much money was shared by P and Q?

Method I sh 6720

+ sh 4800

Sh 11520

Method II

Formation of the equation.

Total of ratio 7 + 5 = 12

of y = sh 4800

x y = sh 4800

960

x x y = sh 48000 x

y = sh 11520

b. A , B and C share a certain sum of money in the ratio 2 : 3 : 5 respectively. If C gets sh 15,000 more than A.

a) How much does each get?

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | C | T.T |
| 2 | 3 | 5 | 10 |

Difference in ratio 5 – 2 = 3

of y = sh 15000

5000

x x y = sh 15000 x

y = sh 50,000

A’s share B’s C’s

x 50000 x sh 50000 x sh 50000

= sh 10,000 = sh 15000 = sh 25000

b. How much money is shared?

Sh 10,000

Sh 15,000

+ Sh 25,000

Sh 50,000

**EXERCISE**

1. The size of 2 angles on a straight line are in the ratio 2 : 3. Find the size of the angles.
2. Lucy and Danny shared some money in the ratio of 2 : 5 respectively. If Lucy got 1500/- less than Danny, how much did Danny get?
3. The ratio of the length to the width of a rectangle is 3: 2 respectively. If the perimeter of the rectangle is 40cm.
4. Find the actual length and width of the rectangle.
5. Find the area of the rectangle.
6. A and B shared money in the ratio of 3 : 7 respectively. If B got shs 4000 more than A ,
7. Find A’s share
8. Find their total share.

**References**

**- Mk Maths bk 8 pg 98 – 100**

**- Fountain Pri. Maths Simplified approach bk 7 pg 118 – 120**

**INDIRECT PROPORTIONS**

L/A : The more pupils share the less each one gets.

- The faster we travel the less time the journey takes.

- The more workers they are, the less time

In proportion, the required quantity is always on the right hand side.

When one quantity increases the other quantity decreases.

1. Given that 12 men take 6 days to slash the Greenhill Academy play ground. How many days will 8 men take to slash the compound?

Men days

12men take 6 days

1 man takes 6 x 12

12 days

8 men take days

9 days

1. 25 workers can construct a road in 8 days. How many less workers are required to complete the work in 10 days?

Days workers

8 days required 25 workers

1 day requires 25 x 8

10 days

= 20 workers

Less number of workers

25 – 20

= 5 less workers

Exercise

1. 9 girls cleaned the compound in 5 minutes. Find how many girls are needed to clean the compound in 15 minutes.

2. When travelling at 50km/hr Kapere took 45 minutes. If Kapere took 25 minutes at what speed was he travelling?

3. A car travelling at a speed of 40km/hr, covers a journey in 4 hours. How long will it take to cover the same journey at 16km/hr?

4. 15 men can repair a road in 30 days. How many more days will 9 men take to do the same work at the same rate?

***Reference***

* ***Fountain Pr. Maths bk 7 pg 124 – 125***
* ***Fountain Pr. Maths bk 7 pg 84 – 85***
* ***New MK bk 7 maths 64***
* ***Pri MK bk 7 pg `03 – 104***
* ***Understanding maths bk 7 pg 70***

**FRACTIONS**

Use BODMAS order to simplify fractions.

BODMAS (simplify)

a. - +

LCD

2 x 2 x 3

4 x 3

= 12

2 2 3 4

2 1 3 2

3 1 3 1

1 1 1

BODMAS

+ -

=

=

b. ( - ) x BODMAS x =

2

( ) x

**Exercise**

1. + of 2

2. ÷ ( - ÷ )

3. (1 - of ) x 2

4. - +

5. + of -

**References**

**Primary level Supp. Maths pg 42**

**Mk bk 7 pg 74**

**WORD PROBLEMS (FRACTIONS)**

**- Use simple fractions to solve word problems.**

**Notes**

1. of Jame’s chickens were white while the rest were red. If the white chickens were 120, how many chickens were there altogether?

were white

120 were white

Let the number of chicken be p.

of p = 120

x x p = 120 x

P = 360

2. Jim ate of the cake and Joan ate of the cake. The rest was eaten by Peter.

a. What fraction did Peter eat?

Total fraction

+ = = =

Peter’s fraction 1 - = - =

b. If Peter’s part weighed 20 grams , what was the total weight of the cake?

Let the total weight be p.

of p = 20 grams

x p = 20 grams

x x p = 20g x

P = 5g x 15

P = 75 grams

**Exercise**

1. Kyobe shared 3 litres of medicine mixture equally among 7 patients. The medicine was a mixture of water and another solution. If of the medicine mixture that each patent got was water, how much water did each patient get?
2. An iron bar is 1 m long. How many pieces, each 3 cm long can be cut from it?
3. At a certain election of those entitled to vote did so. Two candidates A and B stood for the election. Of those who voted, supported B. If A received 4500 votes.
4. How many people were entitled to vote?
5. How many people voted?
6. How many votes did B receive?
7. of an electic pole is below ground level and 15 m is above ground level . What is the length of the pole?
8. Paul travelled of his journey by car, on a bicycle and on foot. If 16km were still left, how long was the journey?

**References**

1. **Primary level Supp. Maths pg 43**
2. **Understanding Maths bk 7 pg 75 – 76**
3. **Mk Maths bk 7 pg 77**

**APPLICATIONS OF FRACTIONS**

**S.T. (TAPS)**

**L.A. Recording time**

Calculate the amount of water. (in terms of fractions)

**NOTES**

1. One tap fills a tank in 8 minutes and another in 4 minutes. How long will both take to fill the same tank?

In one minute one tap fills of the tank. In 1 minute another tap fills of the tank.

Both taps filled + = = every minute.

So 1 tank ÷

1 x = = 2 minutes.

1. Tap A takes 6 minutes to fill the tank and tap B takes 8 minutes to draw out water from the tank. How long will it take to fill the tank if both taps are left open?

Tap A fills of the tank

Tap B draws of the tank

In one minute

- = =

of the tank is filled in 1 minute.

1 tank ÷

1 x = 24

= They will take 24 minutes

**Exercise**

1. A bucket holds 15 litres of water. How many times can it be filled from a water tank which contains 930 litres?
2. Pipe A fills a barrel with water in 14 minutes while pipe B fills in 7 minutes. How long will it take to fill the barrel if both are opened at the same time?
3. A pump filled a barrel in 8 minutes and another emptied it in 10 minutes. How long would it take to fill it if the two were opened at the same time?
4. Akide can dig a garden in 8 days and Bernard can dig in 10 days.
5. What fraction of the garden can they dig in 1 day if both work together?
6. What fraction of the garden is left after both have been working for 4 days?
7. Water from a tap can fill an empty tank in 5 minutes. A second tap is left open can empty the full tank in 6 minutes. If the tank is empty and both the taps are left open, how long will it take to fill the tank?

**Reference**

**Pr. Level Supp. Maths bk 8 pg 43**

**Mk Maths bk 7 pg 79**

**A new Pr. Mk maths 7 pg 56**

**APPLICATION OF FRACTIONS**

**S.T. INVOLVING PARTS OF THE REMAINDER**

**L.A: - Understanding fraction differences in terms of sharing**

**- Recognize the shared quantity**

**NOTES**

1. John spent of his money on books and of the remainder on transport.
2. What fraction of his money was left?

books Remainder Transport

1 - of

- x

=

Fraction left

1 - ( + )

1 – ( )

1 -

- =

1. If he left with sh 15000, how much did he have at first?

Let it be p.

x p = sh. 15000

x x p = sh 15000 x

P = sh 27000

1. On a farm of the animals are black, of the remainder are brown.

Black reminder brown fraction left

1 - x -

- =

=

**Exercise**

1. of the wire is painted black, of the remainder is painted green , the rest of 20 metre wire is red. How long was the wire?
2. A man spent of his salary on food of the remainder on rent and saved sh. 60,000. Find the man’s salary?
3. A woman spent of her money on treatment, half of the remaining money on transport and saved sh 5,000. How much money did she have?
4. A bank paid off of the profit to its clients and of what was left to its workers. The remaining money was banked. If sh.400,000 was banked.
5. How much profit was shared by the clients?
6. How much was paid to the workers?
7. A man sold off his land and gave out of what was remaining. What fraction remained?

**References**

**A new Mk bk 7 Maths pg 55**

**Mk Maths bk 7 pg 78**

**Understanding Maths bk 7 pg 75 – 76**

**APPLICATION OF FRACTIONS**

**S.T - WATER TANKS**

L.A - Tell the amount of water in the container.

- Able to use water responsibly (water is a source of life)

- Provide motivation to learners on every day activities.

NOTES

1. A tank is full of water when 400 litres are removed it becomes full.
2. What is the amount of the tank when full?

- = =

Let the capacity be m.

of m = 400 litres

x m = 400 litres x

m = 2400 litres

1. A tank was full of water when 200 litres were removed, it remained full.

How many litres does the full tank hold?

1. A tank is full of water when 60 litres are added, it becomes full.
2. What is the capacity of the tank when full?
3. How many litres of water are in the tank when full.
4. A drum is full of water when 20 litres are used; the drum becomes full of water. How many litres does the drum hold when full?

**References**

**Teacher’s collection – Tr. Kirimuttu**

**PERCENTAGES**

**S.T – Comparing percentages**

**L.A – Revise pairs that make 100%**

**- Compare using percentages (percentage more ) ( percentage different)**

**Notes**

1. In a certain farm there are 30% more goats than sheep. If the number of sheep is 140, what is the total number of goats and sheep all together?

Let the % of sheep be m

m + n + 30% = 100%

2m + 30% - 30% = 100% - 30%

2m = 70%

= P x R x T = SI

m = 35%

% of goats = (35 + 30)% = 65%

x x y = 140 x

y = 400

400 animals

1. In a school, there are 20% more boys than girls. If there are 600 girls, how many boys are there?
2. The number of children who were immunized against measles in Katakwi district last year was 20% more than this year. 2640 were immunized last year. What is the number of the children immunized this year?
3. In a group of swimmers, there are 20% less boys than girls. If there are 30 girls, how many swimmers are in the group?

**Reference**

**Fountain Prim. Maths bk 7 pg 130 – 132**

**Mk Maths bk 6 pg 147 , 151**

**Mk maths bk 7 pg 113 – 114**

**FINDING PRINCIPLE, RATE AND TIME GIVEN SIMPLE INTEREST**

Learning activities

- Calculate the principle, rate, time

**PRINCIPAL**

1. What sum of money will yield an interest of sh. 6000 at 5% for 3 years.

P = Principle

R = Rate 5%

T = Time 3 years

SI interest sh 6000

P =

2000 20

P = x

P = 2000 x 20

P = sh. 40000

1. What principle will yield sh 1200 interest at 5% for 9 months?
2. Chebrot borrowed some money at 10% per annum. At the end of 2 years he paid an interest of sh.6000. How much was borrowed?

**TIME**

1. In what time will sh.12, 000 yield an interest of sh 1800 at 5% per year?

P x T x R = SI (Subtraction)

Principle = sh 12000

Rate 5%

Time

Time = ( )

SI = P x T x R

Shs 1800 = x T x sh 12000

P x R x T = SI

Sh 12000 x x T = sh 1800

3

Sh x T =

T = 3

Time will be 3 years.

**Exercise**

1. How long will sh.20,000 take to yield an interest of sh 5,000 at 2% p.a?
2. A man borrowed sh 120,000 at a rate of 20% per annum. How long will he use the money to pay an interest of sh 10,000.
3. A man paid a total of sh.180,000 after borrowing sh.54,000 at 10% per annum. For how long did he use the money.
4. Calculate the time required for Sh. 580,000 to give an interest of sh.60,000 at a rate of 5% p.a.

**SIMPLE INTEREST**

1. Find simple interest on sh.4,500,000 for 8 months oat 12% per annum.
2. Find simple interest on sh 900,000 for 6 months at 72% per annum.

**PRINCIPLE**

1. Calculate the principle amount of money which earns sh 54,000 interest in 42 years at 13% p.a.
2. A company paid sh 120,000 as interest for a 2 year loan of 6% per year. How much money did the company borrow?

**RATE**

1. Calculate the rate at which sh 32,500 will give an interest of sh 3250 in 2 years.
2. A woman borrowed sh 500,000 for 6 months. At the end of that time, she repaid the principle plus interest of sh 515,000. At what interest rate was she paying?
3. Find the simple interest rate percent per annum if sh 30,000 yield as sh 4000 interest in 2 years?
4. Sengendo banked sh x for 4 years at 5% p.a simple interest. If his interest for the 4 years amounted to sh 1500. How much money did he bank?
5. Halima borrowed sh 125,000 for a year. She paid back sh126,750. Find the rate of interest at which she was charged?

**References**

**Mk Pr. Maths bk 7 pg 134 – 143**

**A new Mk Pr. Maths bk 7 pg 71 – 75**

**Fountain Pri Maths bk 7 pg 90 – 91**

**Fountain a simplified App. Pg. 141 – 147**

**Primary Maths for Uganda pg 70 – 72 , 73 , 74**

**FINDING BUYING PRICE GIVEN % LOSS PROFIT AND SELLING PRICE**

L/A: - Explore relationship between buying price, selling price and percentage loss, percentage profit.

- Explain when to get a loss and profit.

**PERCENTAGE PROFIT / LOSS**

PROFIT = selling price – cost price

LOSS = cost price – selling price

The cost of a pair of shoes is sh 12,500. A shopkeeper sold it at sh 15,000

Calculate the profit made?

Profit = selling price – cost price

Sh 15,000 – sh 12,500

After investing sh x for 2 years at 4% p.a. simple interest, a man had sh 6480 in the bank. Find i) the interest ii) the principle

A = P + I

P = A – I

I =

I =

= 25I = 2 (6480 – I)

25I + 2I = 12960 – 2I – 2I

I =

Sh 15,000

- sh 12,500

Sh 2,500

I = sh 480

P = sh (6480 – 480)

P = sh 6000

2. Batto bought a bull for slaughtering at sh 225,000, when he sold the meat , he earned sh 218,000. Calculate his loss.

Loss = (cost price – selling price)

= sh 225,000 – sh 218,000

= sh 225,000

- sh 218,000

Sh 7,000

1. A book was bought at sh 800 and was sold at sh 900. Calculate the percentage profit.

Cost price \_\_\_\_\_\_\_ sh 800

Selling price \_\_\_\_\_\_\_ sh 900

Profit made \_\_\_\_\_\_\_\_ SP – CP

= sh 900 – sh 800

= sh 100

Profit as a fraction =

=

Percentage profit -------- ( )%

12

8 100

8

20

16

= 12 12

1. Calculate the percentage loss if cost price is sh 5,800 and selling price is sh 5,000.

Cost price = sh 5,800

Selling price = sh 5000

Loss = sh 5800 – sh 5000

= sh 800

Percentage loss = ( )%

13

29 400

- 29

190

187

23

= ( )%

= 13 %

**Exercise (Percentage profit)**

1. A man bought a car at sh 4,200,000 and sold it at a profit of sh 200,000. Calculate the percentage profit.
2. The profit on a shirt which was sold at sh 48,000 was 3000. Calculate the percentage profit.
3. A lady sold a ratio for sh 85,000 making a profit of sh 5,000. Calculate the percentage profit.

**THE BUYING PRICE , COST PRICE FROM THE SELLING PRICE AND % PROFIT.**

1. Birigwa bouht a DVD player at sh 300,000 and sold it at 10% profit. Find his selling price.

Solution : new % = 100% + 10%

= 110%

x sh 300,000

= sh 330,000

1. A fridge bought for sh 600,000 was sold at a loss of 25%. Calculate the selling price.

New % = 100% - 25%

= 75%

New amount = x sh 600,000

= 75 x sh 6000

= sh 450,000

**Exercise**

1. A trader bought a set of chairs at sh 70,350, he sold it later making a loss of 33 %. Calculate his selling price.
2. I bought a bicycle at sh 80,000 and then sold it at a loss of 20%. What was the selling price?
3. A car bought for sh 60,000 was sold at a profit of 12 %. Calculate the selling price.
4. The amount on the price tag of an article in Mrs. Mukasa’s shop is sh 400,000 and deducts 5% for cash payment. Calculate the selling price.
5. A machine was bought at sh 5000 and then sold at a profit of 12 %. Calculate the selling price.

**FINDING COST PRICE GIVEN PERCENTAGE PROFIT OR % LOSS AND SELLIGN PRICE**

**NOTES**

1. By selling a blanket at sh 36000, a trader made a profit 20%. Calculate the cost price of the blanket.

New % = 100% + 20%

= 120%

Cost price% = 100%

120% ----------- sh 36000 ( )

1% -------------

100% ------------sh 3000 x 100

= sh 30,000

1. A dealer sold a bicycle for sh 45000 there by losing 10%. Calculate the original price of the bicycle.

New % = (100 – 10)%

= 90%

Original % = 100%

90% = 45000

1% =

500

100% = ( )

= sh 50000

**Exercise (Cost price given % loss and % profit S.P)**

1. Calculate the cost price of a blanket sold at sh 36,000 with a profit of 20%
2. By selling a sewing machine at sh 115,000, a dealer makes a profit of 15% on the selling price. What is his cost price?
3. By selling a skirt at sh 45,150 a dealer made a loss of 12 %. Calculate the cost price for the skirt.
4. The crest foam amount on the price tag of its mattresses is sh 40,000 each. It deducts 4% for cash payments and 2 % trade discount. A retailer bought many mattresses and paid cash. How much did he pay for the mattress?

**References**

**Mk bk 7 maths pg 123 – 128**

**Fountain simplified bk 7 maths pg 138 – 141**

**MORE APPLICATION ON PERCENTAGE PROFIT AND LOSS**

A loss seller bought 30 books at sh 24,000. At what price did he sell the book? If he made a loss of 20%

30 books cost sh 24,000

20% loss x sh 24000

Sh 4800

Selling price sh 24000 – sh 4800

= sh 19200

640

Cost of each book =

= sh 640

2. The cost price of a 50kg bag of sugar is sh 45,000. At what price must he sell each kilogram in order to make a profit of 20%

**METHOD 1**

Cost price of 50kg bag is sh 45,000

Profit to be made is 20% of sh 45,000

= x sh 45000

= 2 x 45000

= sh 9,000

Selling price for 50kg = sh 45000 + 9000

= sh 54,000

Price for each kg is

= sh 1080

**Method 2**

Selling price = 100% + 20% of cost price

= x 45000

= 12 x 4500

= (10 x 4500) + (2 x 4500)

= 45000 + 9000

= sh 54000

Selling price for each kilogram

is = sh 1080

**EXERCISE**

1. The cost price of a 100kg bag of rice is sh 80,000. At what price must I sell each kg in order to get a profit of 30%
2. Ocen bought a ratio at sh 25,000, he sold it and made a loss of 10%.
3. Calculate his selling price
4. At what price would he have sold it in order to gain 15%
5. Kanywagi bought a tin containing 80 oranges at sh 12,000. He sold them in heaps of 5 oranges each and made a profit of 33 %. How much was his profit?

**SELLING AN ITEM TO VARIOUS PEOPLE USING % PROFIT AND % LOSS.**

1. A man bought a shirt at sh 50,000 and later sold it to Porokondo at a profit of 20%. If Porokondo sold the same shirt to Oladapo making a loss of 15% , how much money did Oladapo pay for his shirt?

Adekule’s selling price

100% + 20% = 120%

x sh 50000

12 x sh 5000

Sh 60000

Oladapo’s buying price

100% - 15% - 85%

x sh 60000

= 85 x sh 600

Sh 51000

1. Calton bought a BIG SAM jean trouser at sh 40000 selling it to Gideon at a loss of 30%. If Gideon sold the same trouser to Lokoroi at a profit of 40%.
2. How much money did Gideon pay for the trouser?

Calton’s selling price

100% - 30% = 70%

x 40000

Sh 7 x 4000

Sh 28000

1. How much money did Lokoroi pay for the trouser?

Gideon’s selling price is Lokoro’s buying price

100% + 40% = 140%

x sh 28000

14 x sh 2800

Sh 39200

**Exercise**

1. Mukasa bought a suit at sh 250,000 and later sold it to Petero at a profit of 12%. Petero sold it to Nyakana at a loss of 7%. How much money did Nyakana pay for the suit?
2. Malcom purchased a watch at sh 76000 and then sold it to Kikomeko at a loss of 15%. Kikomeko later sold it to John at a profit of 10%. How much money did John pay for the watch?
3. A school of 2000 pupils lost 25% of their pupils to the neighbouring schools last year. This year the school gained 10% from other schools. What is the population of the school now?

**Reference : Teacher’s own collection**

**INTEGERS**

**ADDITION OF INTEGERS USING NUMBERLINE**

1. +3 + +4

-7 -6  -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7

+7

+3

+4

-9  -8 -7 -6  -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7

+2

+3

+4

-5

2. +3 + +4 + -5

**Exercise**

1. +4 - + 7 3. -4 - +7 5. +7 + -4

2. -4 - -7 4. -7 - -4

**References**

**Mk bk 7maths pg**

**Fountain simplified maths bk 7 pg 306 – 311**

**MULTIPLICATION OF INTGERS USING NUMBER LINE**

3 x +5

3 laps of 5 steps in the positive direction.

-4 x 3 using a commutative

-4 x 3 is also 3 x -4

3laps of 4 steps in the negative direction.

**Exercise**

a. 3 x +4 c: -2 x +7 e: -6 x +3

b. +2 x -6 d: -3 x +2

**Reference**

1. **Mk Maths bk 7 pg 319**
2. **Fountain mathematics bk 7 pg 316**

**DIVISION OF INTEGERS BY CALCULATION**

**In division of integers we follow the rules of integers as it is in multiplication.**

1. + ÷ + = + - ÷ + = -
2. - ÷ - = + + ÷ - = -

Work out the following;

a) 21 ÷ 7 b) -24 ÷ -3 c) 48 ÷ -6 d) -108 ÷ 12

21 ÷ 7 = 3 - 24 ÷ -3 = +8 48 ÷ -6 = -8 -108 ÷ 12 = -9

Exercise

Work out the following

1. 22 ÷ 11
2. -18 ÷ 3
3. – 17 ÷ 2
4. -36 ÷ -4
5. -120wx2 ÷ 6wx

**APPLICATIN OF INTEGERS**

1. Aguti arrived at the station 15 minutes before the normal departure time for a train to Kasese. If the train was 35 minutes late, how long did she wait for the train?

- 15 +35

35 - (-15)

35 + 15

= 50

1. A lady was born in 17 BC and died in 35AD. How old was she when she died?

The year 17BC can be thought of as -17 and the year 35AD can be thought of as +35

The lady lived from -17 year to +35 year.

+35 – (-17)

35 + 17 = 52 years

Lady was 52 years

**Exercise**

1. A woman was born in 20BC and died in 45AD. How old was she when she died.
2. Kigombe borrowed sh 50,000 he received sh 72,000 at the end of the month as salary. How much did he remain with after paying the debt?
3. Mary moved 7 steps westwards of her home then 6 steps east wards, 3 more steps to the east and finally moved 4 steps westwards. How far was she from her home?
4. The temperature on Mt. Elgon was -40c during mid night, but by midday there was a rise in temperature by 100C. What was the new temperature on Mt. Elgon?
5. The time at longitude 150E to 4:30pm. What is the corresponding time at longitude 400W?
6. Given that John lives at longitude 180E and his friend Kay lives at 300W. If Kay’s time 10:15am. Calculate John’s corresponding time.

**References**

**Mk maths bk 7 pg 322 – 323**

**Fountain Pr. Maths bk 7 pg 305**

**USING A DIAL TO ADD AND SUBTRACT IN FINITE SYSTEM**

In modular arithmetic, we concentrate on digits in the place value of ones and these make up our answers.

- We don’t write a digit greater than or equal to the finite on modular we are operating in.

+ 4 + 2 = n (Finite 5)

Add

0

2

3

4

1

+4 + 2 = 1 (Finite 5)

Subtract 3 – 5 = \_\_\_\_\_\_ (Mod 7)

0

1

2

6

5

3

4

3 – 5 = 5 (Mod 7)

**Exercise**

1. Add using a dial

2 + 3 = \_\_\_\_\_\_\_\_\_\_\_\_\_(Mode 4)

6 +5 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mode 7)

3 + 2 + 4 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mod 6)

4 + 3 + 2 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mod 5)

5 + 2 + 3 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mod 7)

1. Subtract using a dial.

2 – 4 (Finite 5)

3 – 5 (Finite 7)

9 – 11 (Finite 12)

1 – 7 (Finite 8)

3 – 6 (Finite 7)

**References**

**Mk maths bk 7 pg 329 – 330**

**Fountain maths bk 7 pg 328 – 330**

**FOUR OPERATIONS IN FINITE GIVEN SYSTEMS (TABLES)**

**FINITE 6 (SUBTRACTION)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **\_\_\_\_** | **1** | **2** | **3** | **4** | **5** | **0** |
| **1** | **0** | **5** | **4** |  |  |  |
| **2** | **1** |  |  | **4** |  | **2** |
| **3** | **2** |  | **0** |  |  | **3** |
| **4** |  | **2** |  |  |  |  |
| **5** |  |  |  | **1** | **0** |  |
| **0** | **5** |  | **3** |  |  |  |

1 – 1 = 0 (Mod 6)

1 – 3 = (Mod 6)

6 + 1 – 3 = (Mod 6)

7 – 3 = 4 (Mod 6)

3 – 0 = 3 (Mod 6)

**FINITE5 (MULTIPLICATION)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 0  1 x 2 = (Finite 5)  2 = (Finite 5)  3 x 3 = (Finite 5)  9 ÷ 5 = 1 rem 4  = 4 (Finite 5) |
| 1 | 1 | 2 | 3 | 4 | 0 |
| 2 | 2 |  |  |  |  |
| 3 | 3 |  | 4 |  | 0 |
| 4 | 4 |  |  |  |  |
| 0 |  | 0 |  | 0 |  |

**FINITE 6 (DIVISION)**

When a number divided is finite, we just shade its square as shown.

2 ÷ 4 (Mod 6)

(6 + 2) ÷ 4 (Mod 6)

8 ÷ 4 (Mod 6)

2 (Mod 6)

2 ÷ 5 = (Mod 6)

6 + 2 ÷ 5 = (Mod 6)

8 ÷ 5 = (Mod 6)

6 + 8 ÷ 5 = (Mod 6)

14 ÷ 5 = (Mod 6)

6 + 14 ÷ 5 = (Mod 6)

20 ÷ 5 = 4 (Mod 6)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **÷** | **1** | **2** | **3** | **4** | **5** | **0** |
| **1** |  |  |  |  |  |  |
| **2** | **2** |  |  | **2** | **4** |  |
| **3** |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |
| **5** | **5** |  |  |  |  |  |
| **0** | **3** |  |  |  |  | **1** |

**(MOD 5) ADDITION**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **+** | **0** | **1** | **2** | **3** | **4**  1 + 4 = (Mod 5)  5 ÷ 5 = 1 r 0  = 0 (Mod 5)  3 + 2 = (Mod 5)  5 ÷ 5 = 1 rem 0  = 0 (Mod 5) |
| **1** | **1** | **2** | **3** | **4** | **0** |
| **2** | **2** |  |  |  |  |
| **3** | **3** |  | **0** | **1** | **2** |
| **4** | **4** |  |  |  |  |
| **0** |  | **1** |  | **3** |  |

**Reference**

**Mk maths bk 7 pg 329**

**Fountain maths bk 7 pg 328 – 336**

**SOLVING EQUATION IN VARIOUS FINITES**

1. 2 x = 3 (Finite 5) Add the finite until you get a multiple of 2

2 x = 3 + 5 (Finite 5)

2 x = 8 (Finite 5)

2x = 8 (Finite 5)

2 2

x = 4 (Finite 5)

1. 4 x – 2 – 5 (Finite 7)

4 x -2 + 2 = 5 + 2 (Finite 7)

4x = 7 (Finite 7)

4 x = 7 + 7 (Finite 7)

4 x = 14 (Finite 7)

4 x = 14 + 7 (Finite 7)

4x = 21 (Finite 7)

4x = 21 + 7 (Finite 7)  
4x = 28 (Finite 7)

= (Finite 7)

X = 7 (Finite 7)

X = 7 ÷ 7 = 1 rem 0 (Finite 7)

X = 0 (Finite 7)

1. p – 5 = 14 (Mod 15)

4 x p – 5 x 4 = 14 x 4 (Mod 15)

P – 20 = 56 (Mod 15)

P – 20 + 20 = 56 + 20 (Mod 15)

P = 76 (Mod 15)

P = = 5 rem 1 (Mod 15)

P = 1 (Mod 15)

**Exercise**

1. 3x = 3 (Finite 4)
2. 5x = 3 (Finite 9)
3. 3x – 3 = 4 (Finite 7)
4. 3x – 6 = 2 (Finite 8)
5. P – q = 10 (Mod 12)
6. = 9 (Mod 13)
7. + 4 = 2 (Mod 5)
8. - 3 = 6 (Mod 7)

**Reference**

**Pri. Maths Rev. & Pr. Gladys Wambuzi pg 20**

**Mk maths bk 7 pg 332 – 333**

**APPLICATION OF FINITE 7 AND 12**

**Telling days of the week.**

Mon corresponds to 1 (one)

Tue corresponds to 2 (two)

Wed corresponds to 3 (three)

Thur corresponds to 4 (four)

Fri corresponds to 5 (five)

Sat corresponds to 6 (six)

Sun corresponds to 0 (zero)

1. If today is Tuesday ,what day of the week will it be after 25 days?

Day + 25 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mod 7)

2 + 25 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Mod 7)

= (Mod 7)

= 3 rem 6 (Mod 7)

= 6 (Mod 7)

6 Saturday.

1. Today is Friday, what day of the week was it 45 days ago?

Day + No of days = Today (Mod 7)

X + 45 = 5 (Mod 7)

Call that day x you don’t know

X + 45 – 45 = 5 – 45 (Mod 7)

X =

The remainder is negative = -5 rem -5 (Mod 7)

so add the Mod 7 = -5 (Mod 7)

= -5 + 7 (Mod 7)

= 2 (Mod 7)

The day was a Tuesday 45 days ago.

**Exercise**

1. If today is Thursday, what day of the week will it be after 65 days?
2. Given that today is Tuesday, what day of the week was it 281 days ago?
3. Today is Sunday. What day of the week was it 72 days ago?

If 5th November 1990 was Wednesday , what day of the week was 30th January 1991?

Days left in November 1990 = (30 – 5) = 25

No of days in December 1990 = 31

No of days in January 1991 = 30

Total no. of days = 86

No. of days + 86 = (Mod 7)

3 + 86 = (Mod 7)

= (Mod 7)

12 rem 5 (Mod 7)

= 5 (Mod 7)

The day was Friday.

**Exercise**

1. If 1st Jan. 1991 was Monday, what day of the week was 2nd November?
2. If 2nd April 1992 was Monday, what day of the week wasz 2nd November 1990?
3. If 26th June 1996 was a Thursday, which day of the week was the 11th September 1996?

**References**

**Pr. Maths Rev & Pr. Gladys Wambuzi pg 21**

**Mk maths bk 7 pg 334 – 336**

**APPLICATION OF FINITE 12**

Time - an odd quotient changes (p.m to a.m) and (a.m to p.m)

- An even quotient leaves (a.m as a.m ) and (p.m as p.m)

1. It is now 8:00 am , what time of the day will be after 68 hours?

8 + 68 (Finite 12)

6

12 76

- 72

4

76 (Finite 12)

4 (Finite 12)

The time will be 4:00 am

The quotient and remainder determines the a.m and p.m

2. If the time now is 11:00p.m, what time of the day will it be after 27 hours?

11 + 27 (Finite 12)

3

12 38

- 36

2

38 (Finite 12)

2 (Finite 12)

2 :00 a.m

**Exercise**

1. It is 11:00pm now, what time will it be after 37 hours from now?
2. A meeting started at 8:00 am , it lasted for 8 hours , at what time did it end?
3. Cissy travelled for 81 hours after leaving at 2:30 p.m. At what time did she arrive at the destination.
4. A plane left London at 7 :30 a.m. if it landed at Entebbe after 36 hours , at what time did it land?

**References**

**Mk primary maths bk 7 pg 338 – 339**

**Primary maths Gladys Wambuzi pg 23**

Applying more than one finite in solving problems

1. A teacher put pens in groups of 9 and seven pens were left, when he put them in groups of 8 , only 4 pens were left. When he put them in groups of 3 ,only one pen was left. How many pens did the teacher have?

7 (Finite 9 ) = 7 , 16 , 25 , 34 , 43 , 52 , 61…

4 (Finite 8) = 4 , 12 , 20 , 28 , 36 , 44 , 52, 60 …

1 (Finite 3) = 1 , 4 , 7 , 10 , 13 , 16 , 19 , 22 , 25 , 28 , 31 , 34 , 37 , 43 , 46 , 49 , 52…

The common number is 52

To get the required value, keep adding the finite to the given remainder until you get a common number.

1. What is the least number of cows when divided by 4 people, 3 cows remain, when divided by 8 people 7 cows remain?
2. A class teacher arranged children of his school in groups of 5 and 1 remained. When he arranged them in groups of 11 , 8 remained. Find the least number of pupils in that class.
3. A man had some oranges. When he grouped them in heaps of 6 , 5 oranges were left and when he put them in groups of 7 , 6 remained. How many oranges did he have?
4. Nakintu was to seat visitors. By seating them in fours, one could remain. By seating them in nines, six could remain but by seating them in fives, three could remain. How many visitors was Nakintu to seat?

**Reference**

**Mk Prim. Maths approved NCDC and Moses pg 84**

**Prim. Maths 2000 bk 7 pg 340.**

**THEME : INTERPRETATION OF GRAPHS AND DATA**

**TOPIC : DATA HANDLING**

1. Application f mean

The mean age of 5 children is 12 years, if a sixth child joins them , the mean age becomes 11 years, find the age of the 6th child.

Total age of 5 children = 5 x 12

= 60 years

Total age of 6 children

6 x 11

= 66 years

Age of the 6th child. ( 66 – 60) years

= 6 years

**Exercise**

1. The average age of 6 boys is 13 years. If one boy leaves the group, the average age becomes 14 years.
2. The average weight of 6 pupils is 40kg. The average weight of other 4 pupils is 30 kg. Find the average.
3. The average age of four girls is 12 years. Given that the average age of the three girls is 13 years. Find the age of the fourth girl.
4. The average weight of 3 boys is 33kg. if a fourth boy joins the group , their average weight becomes 40kg. Find the weight of the fourth boy.

**References**

**Fountain Pr. Maths pg 133**

**FORMING AND SOLVING EQUATIONS INVOLVING MEAN**

1. A class went out on a research study and came up with the following findings 3 , 2a , 0 , 12 and 3a. Find the average of the data.

Average =

=

=

= +

= 3 + a

**Exercise**

1. The mean of y + 1 , 5 and y is 6. Find the value of y.
2. The average of a , a – 7 , 3 and 2a is 8
3. Find the range
4. The mean mark of 1 , 3 , 4 , 5 , t , 8 , 13 is 6. Find
5. The value of t
6. The median mark
7. The mode

**References**

**Fountain Pr. Maths pg 133**

Co-ordinate graph

L.Activity – Locate their places

- plotting points

The x to y order of plotting co-ordinates

Name parallel lines

x = -4

x = -3

x = -2

x = -1

x = 1

x = 2

x = 3

x = 4

-4 -3 -2 -1 0 1 2 3 4

2

1

-1

-2

-3

y = 2

y = 1

y = 0

y = -1

y = -2

y = -3

Plot the following points

A (-1 , 3) B (2 , 4) C (-2 , -2) D (-4 , 0)

E (+3 , -3) F (-5 , -4) G (-4 , 4)

1. On the grid , plot the following points given.

A (-4 , -2) B (-3 , -3) C(-1 , +3) D (-5 , 3)

E (+2 , -4) F (4, 3) G (3 , 0) H(0 , -3)

1. Draw a co-ordinate plane and plot the following points.

A (3 , 5) B(-2 , 4) K(-3 , -4) T(4 , -2) W(0 , 5)

**Reference**

**Fountain Pri.maths bk 7 pg 124 – 126**

**Mk bk 7 pg 176 – 180**

NAMING POINTS

Plot and form figures (Area)

Join A to B . B to C , C to D.

Name figure formed

Calculate the area of the figure (1 square = 1 cm)

5

3

3

5

A = L x W x b x h

= (5 x 3) sq units x 3 x 5

= 15cm2 = ------ 7.5cm2

Total area

15

+ 7.5

22.5cm2

**Exercise**

1. Plot the points, name the figure formed and find the area. (Take 1 square = 1 cm)
2. A (-3 , 3) B(2 , 3) C(5 , -3) D(-5 , -3)
3. A(-5 , 4) B(1 , 4) C(1 ,1) D(5 , 1) E(5 , -2) F(-5 , -2)
4. W(4 ,5) X(4 , -4) V(-1 , -4) Z(-1 , 2)
5. R(-3 , 3) S(0 , 5) T(3 ,3) U(0 , 5)

**Reference**

**Primary mathematics 2000 bk 7 pg 183**

**Equations of the line (filling the table and drawing it)**

Y = x + 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | -1 | -2 |
| y | 1 | 2 | 3 | 0 | -1 |

Draw graphs

Y = x – 2

Y = x + 4

Y = x – 3

Y = 3x – 4

Y = 2x – 3

**Reference**

**Mk bk 7 2000 pg 187**

**Fountain primary maths pg 126**

**A new mk bk 7 pg 102 - 103**

**TRAVEL GRAPH**

**Interpreting travel graphs**

The travel graph below represents the distance travelled and the time taken. Time is shown on the horizontal axis and distance is shown on the vertical axis.

1. What is the represented by the shaded square?

It represents the scales on both the horizontal and vertical axes.

One small square represents 30 min on the horizontal axis.

On the vertical axis / Small Square represents 20km.

1. At what speed is the motorist moving?

At 80kmper hour

80km/hr

1. At what speed is the cyclist moving in the first part of the journey at 20km/hr.
2. What time did the motorist take to cover 160km?

Took 2 hours to cover 160km

1. How long did the cyclist rest?

He rested for 1 hour.

1. Calculate the cyclist’s average speed?

Average speed =

=

= 20km/hr

**Exercise**

1. The graph below represents the distance and time taken by two vehicles. Study it and answer the questions that follow.
2. At what speed was the bus travelling?
3. What distance did the train cover in 1 hour?
4. What distance did the train cover in 1 hour?
5. At what time did the two vehicles start their journey?
6. What is the scale on the vertical axis?
7. What distance did the train cover in3 hours?
8. The graph represents a cyclist’s journey from Kampala to Luwero through Bombo and back to Kampala.
9. What is the scale on the vertical and horizontal axis?
10. How far is Bombo from Luwero?
11. At what speed was the cyclist riding between Bombo and Luwero?
12. For howlong did he rest at Luwero?
13. How many hours did the whole journey take?

**DRAWING TRAVEL GRAPH**

Roy left at 8:00a.m and travelled for 2 hours at a speed of 60km/hr. draw a graph for his journey. (Vertical scale 1 small square = 30km)

Speed =

D

S

T

Distance = S x T

= x 2 hrs

= 120 km

1. Mrs. Barigye left home at 9:00am travelling at 40km/hr for 1 hr. he rested for 1 hour and then continued hey journey for 2 hours at 30 km/hr. draw a graph for the journey (Vertical scale : 1 small square = 10 km)
2. A and C are two town 120km apart. Sarah leaves town A at 8:00 am travelling at 30km/hr to town B. where he had to meet Peter who left town C at 9:00am travelling at 60km/hr. Peter and Sarah arrived at the same time at town B.
3. Draw a graph for their journey (vertical scale 1 small square = 10km)
4. How far is town B from town A?
5. How far is town B from town C
6. At what time did they arrive at town B?

**TOPIC : LENGTH , MASS AND CAPACITY**

**LENGTH**

**AREA**

**1. CONVERSION OF M2 TO CM2**

**NOTE**: - Area is the amount of surface of a given region.

- Area is given in square units.

- M2 is read as square metres

- Cm2 is read as square centimeters

**Teaching learning activities**

- Estimating area of a given region in M2 or CM2

- Using squared paper to compare area of a region by counting square of irregular and regular shapes.

- Using cut outs area of 1cm2 , 100cm2 and 1m2 to measure many surfaces around the room.

Example : Convert 6m2 to cm2

Note : A square with sides 100cm has an area of 1m2.

From 1 m = 100cm

But 1m2 = (100 x 100)cm2

1m2 = 10000cm2

Then 1m2 = 10000cm2

6m2 = (6 x 10000)cm2

= 60,000cm2

Example : Convert 880cm2 to 1m2

Solution : 10000cm2 = 1m2

880cm2 = m2

= 0.088m2

**Exercise**

**Express the following in square cm2.**

a) 15m2 b)0.165m2 c) m2 d) m2 e) 3.05m2

A rectangular table cloth is 150cm by 200cm. What is its area in square metres?

Express the following in m2.

a) 40cm2  b) 8000cm2 c) 44,000cm2 d) 0.49cm2

3. Find the area of the regions below in square centimeters.

10m

8m

10m

1. b) c)

6m

3m

1. Musa planted cassava in a square region of 100m. Calculate that area in square centimeters.

Reference : Intermediate mathematics page 234

**2. Area of a parallelogram.**

**T.L activities**

* Cutting several rectangular regions
* Cutting a corner from each rectangle and fastening it to the opposite side
* Counting squares to show that the number of squares needed to cover the shape is the same as the rectangle.
* Relating the base to length and the height to the width.

Example: Calculate the area of the parallelogram below.

Note: To calculate the area of a parallelogram, multiply the base by the height.

Area = base x height

12cm

13cm

20cm

= 20cm x 12 cm

= 240cm2

**Exercise**

1. Find the area of each of the following parallelograms.

7.2cm

4.2cm

4cm

7cm

3cm

5cm

a) b) c)

1. The following diagrams represents gardens in the shape if parallelograms.
2. Find the area of each parallelogram garden
3. How many flowers should you plant in each garden if it takes 20 plants for 1m2?

6m

12m

2.1m

4.3m

1. Find the area of the parallelogram whose base id 8cm and height 14cm.
2. The area of a parallelogram is 72cm2. Its base is 12cm. calculate its height.

**Area of the Rhombus**

Teaching / learning activities

* Drawing the rhombus
* Identifying its properties by folding and comparing sides.
* Cutting along the diagrams and deriving the formula.
* Finding area given half diagonal, full diagonal or perimeter and one diagonal.

Example 1:Find the area of the rhombus below.

5cm

12cm

5cm

12cm

Area = x d1 x d2  or ( x b x h) x 4

6

= x 10cm x 24cm = ( x 12cm x 5cm) x 4

= 120cm2  = 30cm2 x 4

= 120cm2

Example 2: Calculate the length , area and the perimeter of the rhombus.

Length of each side is hypotenuse

a2 + b2 = c2

(4cm)2 + (3cm)2 = c2

16cm2 + 9cm2 = c2

25cm2 = c2

5cm = c

@ side = 5cm.

Area = x d1 x d2 or ( x 4cm x 3cm ) x 4

= x 8cm x 6cm = 6cm2 x 4

= 24 cm2  = 24cm2

Perimeter = S1 +S2 + S 3 + S1or P = 4 x 5

= 5cm + 5 cm +5cm +5cm = 4 x 5cm

= 20cm = 20cm

**Exercise 1**

1. Find the area of the following rhombuses.
2. The base and height of one of the four congment triangles of a rhombus are 9cm and12cm respectively. Calculate its area.
3. Find the area of a rhombus with two diagonal measuring 10cm and 24cm.

**Reference : PLE 2005 no.38 PLE 2001 no.41 PLE 2014 no.24**

**Exercise II**

1. Find the sides , the perimeter and the area.
2. The sides of a rhombus is 10cm and the shorter diagonal is 12cm. find the longer diagonal and the area.
3. The diagonals of ah rhombus are 32cm and 24cm respectively. Calculate the perimeter of the rhombus.
4. The perimeter of the rhombus is 52cm. if the longer diagonal is 24dm. find the shorter diagonal and the area of the rhombus.
5. ABCD is a rhombus. The diagonals interact at m.
6. What can you say about angle AMB?
7. If AM = 40cm and MB = 30cm , what is the area of the rhombus?
8. XYVT is a rhombus whose total area is 24cm2. If YT = 8cm, find the length of XV and the perimeter of the rhombus.

**Reference : Mk bk 7 page 358 – 360**

**4. Area of a kite**

**Teaching learning activities**

* Cutting, making a kite from paper materials
* Folding and drawing kites
* Identifying properties of a kite
* Deriving the formula for area of a kite

Example : Find the area of the kite below.

Note: (i) AB = BC and AD = CD

(ii) AC is called the cross diagonal.

1. BD is called the main diagonal and it is the line of symmetry.
2. A kite is formed by two isosceles triangles so Pythagoras theory may be applied to find missing letters.

Thus Area = x D1 x D2 longer diagonal

= x 6cm x 12 cm = 4cm + 8cm

= 36cm2 = 12cm

**Exercise**

1. Find the longer diagonal, the shorter diagonal and work out the area of the kite.

2. Find the value of k , the area and perimeter of kite.

3. In the figure (kite) below AC = 10cm , DO = 7cm and AB = 13cm. Find OB and area of the kite.

1. Calculate the area of a kite whose diagrams are 20cm and 10cm respectively.

Reference

Mk bk 7 page 361 – 362

5. **AREA OF A CIRCLE**

Teaching / learning activities

Dividing the circle into sectors (paper or manila)

Cutting the sectors and arranging them to form a parallelogram or rectangle.

Deriving the formula for area of a circle

Example : Find the area of the circle whose radius is 14cm

Note : We use π = when the given radius or diameter is a multiple of 7 and 3.14 when it is not unless otherwise as required by the question.

Solution : Area = πr2

= x 14cm x 14cm

= 44cm x 14cm

= 616 cm2

Example : A circular table cloth has a radius of 20dm. (Take π = 3.14)

Area = πr2

= 3.14 x 20dm x 20dm

= x 20dm x 20dm

= 314 x 4dm2

= 1256dm2

Exercise: Find the area of the circles below. (Take π = )

2. Find the area of the circle below. (Take π = 3.14)

3. Find the area of the circle whose diameter is (take = )

a) 7cm b) 10cm c) 3.5mm

4. Find the area of the circle whose diameter is (take π = 3.14)

a) 4cm b) 2.4dm c) 20mm

5. Calculate the area of a circle whose radius is (leave π as π)

a) 2cm b) pcm c) 18mm

6. calculate the area of a circle whose circumference is

a) 44cm b) 352cm c) 8.8cm

7. A goat is tied to a stump such that the further distance round its grazing place is 44m. calculate the area of the grazing ground.

8. Dan bought a table cloth for his circular dining table. The table has a diameter of 90cm and the cloth hangs 25cm over the edge all round. What is the area of the table cloth?

**References**

1. Fountain math bk 7 pages 351 – 383
2. Mk bk 7 pages 366 – 393
3. Functional math bk 7 pg 192 – 197
4. Supplementary maths 7

**EXTRA EXERCISE**

1. Find the radius of a circle whose area is : (π = )

a) 154cm2 b) 616dm2 c) 22176mm2 d)6cm2

e) 3140cm2  f) 50.24dm2 g)2826cm2 h) 78.5m2

2. The area of a circle is 154cm2. Find the circumference of the circle.

3. The area of a circular compound is 78.5m2. Calculate the distance round the garden.

4. The area of a circular compound is 616m2. Calculate its perimeter.

**6. AREA OF PARTS OF A CIRCLE**

**Teaching / learning activities**

* Drawing circles of given radius and diameter
* Dividing circles into different parts, (sectors) , semi-circle , quadrants and other sectors.
* Using protractor to measure given angles in the circle.
* Making cut outs of different sectors of given angles.
* Relating different parts of a circle to factors of a whole.

Note: The area of a sector of a circle depends upon the angle that the sector subtends at the centre of the circle.

Semi circle quadrant

Thus Area of a semi-circle = πr2

Area of a quadrant = πr2

Area of any sector = πr2

Example : Find the area of each below.

A semi-circle has diameter = (radius + radius)

R = = 7cm

Area = πr2 = x x 7xm x 7cm

= 77 cm2

Area of Quadrant

= πr2 = x x 7dm x7dm

= dm2  = 38 dm2

Area = πr2  = x x 28cm x 28cm

= (11 x 28) cm2

= 308 cm2

**Exercise**

1. Find the area of the shapes below.
2. Semicircle
3. Quadrants
4. Sectors
5. In marking out a plan of a part of a building, a line 8m long is pegged down at one end. Then with the line held horizontally and taut, the free end is swung through an angle of 570. Calculate the area swept out.
6. A bay window is semi-circular in plan. It is to be covered with lead. If the radius of the bay is 2.4m , calculate the area of lead required.

**References:**

**Mk bk 7 page 384**

**Fountain primary maths bk 7page 351 – 383**

**Understanding math book 7 pages 192 – 197**

**Functional math bk 7 pages 228 to 235**

**Supplementary math bk 6 , 7 and 8 page 91**

**7. AREA OF COMBINED SHAPES (ADDING AREA)**

**Teaching learning activities**

Revising formula for different shapes

Identifying shape (common) from given figures

Calculating area by adding

Paying attentions to different units of area

Example : Find the area of the figure below.

Solution:

Area of the rectangle

= L x W

= 20m X 14m

= 280m2

Area of the semi-circle

= x πr2 = ( x x x )m2

= 77m2

Area of the figure = 280m2 +77m2

= 357m2

Exercise:

Find the area if the combined shapes.

**References: Mk bk 7 page 385**

**Supplementary math bk 7 and 8 page 94**

**Fountain math book 7 page 351 – 383**

**Functional math bk 7 page 228 to 235**

**AREA OF SHADED REGIONS (PORTIONS)**

**Teaching / learning activities**

* Identifying shapes (common)
* Identifying formula for area of each
* Calculating area of each
* Subtracting area as required

Example : Find the area of the shaded region.

Area of the rectangle

= L x W

= 16m X 15m

= 240m2

Area of the circle

= π r2

=( x x )m2

= 11m x 14m

= 154m2

Area of the shaded part = 240m2 – 15m2

= 86m2

**Exercise**

Find the area of the shaded parts.

Extra exercise: (Application)

1. Find the area of the shaded parts in a , b and c respectively.
2. A circular table cloth of radius 7cm is placed centrally on the top of a circular table top of radius 14cm. Find the area of the uncovered part.
3. a) The area of the circular un shaded part is 154cm2.
4. Find the length of the square
5. Find the area of the shaded part

b) An iron plate is 20cm square. Four circular holes each of radius 5cm are made in it. Find the remaining

4. A circular flower garden of area 13.86cm2 was dug in the middle of a rectangular compound of 10m by 8m.

a) Find the radius of the flower garden.

b) Calculate the remaining area of the compound.

5. The area of the shaded part is 532cm2. Calculate the radius of the un shaded part.

b) The rectangular field 28m by 22m equals that of a circular pitch. What is the circumference of the pitch?

6. A piece of cloth is laid on a table 90cn long and 70cm wide as shown below. The area covered by the piece of cloth is shaded.

Find the area of the table which is not covered by the piece of cloth.

1. Find the area of the shaded region.

Reference : Mk bk 7 page 396 – 390

Fountain math bkk 7 page 351 – 383

Functional math book 7 pages 228 – 235

Supplementary math bk 6 , 7 and 8 page 91 – 94

**MORE ABOUT AREA : (COMPARING AREA , PLACING TILES AND PLATES)**

**Teaching / learning activities**

* Drawing required shapes
* Cutting out shapes from given shapes
* Comparing area
* Finding number of cards, tiles or plates and calculating area wasted or un wasted.

Example : A sheet of metal measures 32cm by 25cm. how many;

square pieces of each 3cm can be cut from the sheet.

*Solution*

Number that can be cut along the length = 32cm ÷ 3cm = 10 rem 2 (ignore the remainder number that can be cut along the width)

= 25cm ÷3cm = 8 rem 1 (ignore the remainder)

Total number of pieces = 10 x 8 = 80 pieces.

(ii) 5cm by 4cm can be cut from the piece.

= length = 32cm ÷ 5cm = 6 rem 2

Width = 25cm2 ÷ 4cm = 6 rem 1

Total member = 6 x 6 = 36 pieces.

Find the area left un used in each case in (a) above.

Solution : Area of the rectangle

= 32cm x 25cm

= 800cm2

Area of 80 square pieces each 3cm.

= 80 x (3cm x 3cm)

= 80 x 9cm2

= 720cm2

Area left un used = 800cm2 – 720cm2

= 80cm2

(ii) Solution : Area of the rectangle

= 32cm x 25cm

= 800cm2

Area of 36 rectangular pieces 5cm by 4cm

= 36 x (5cm x 4cm)

= 36 x 20cm2

= 720cm2

Area left un used = 800cm2 – 720cm2

= 80cm2

Note 1: When circular cards or plates are to be cut, we consider the diameter.

2. When placing tiles or cardboards, the units must be converted to the same units first.

Exercise:

1. A rectangular floor measures 400cm by 300cm. how many square tiles 50cm by 50cm are required to cover the floor.
2. Abdul cut out circular plates of diameter 7cm from a rectangular sheet of metal of length 45cm and width 35cm.
3. How many circular plates did he cut out?
4. Find the area of the un used sheets after cutting out the circular plates.
5. How many 0.2 square tiles are needed to cover the floor of kitchen 2m 60cm by 2m 40cm.
6. How many rectangular pieces of cardboard each 6cm by 4cm can be cut from a sheet 36cm by 25cm.
7. What area will be left un used.
8. How many tiles each 40cm by 30cm are required to cover the floor of a room 4.2m by 3.2m. What area of the tiles will be wasted?
9. How many cards each 12cm by 5cm can be cut from a sheet of manila 96cm by 26cm. what area of the sheet is left un used?
10. Peter has a rectangular cardboard 30cm by 15cm. he cuts out circular cards of radius 7cm. calculate the area of the remaining cardboard left un used.
11. A rectangular manila card is 49cm by 35cm. circular cards of radius 3 cm are cut out of the manila card.
12. Find the total number of cards cut out of the manila card.
13. Find the area of the manila wasted.
14. A mother prepared square dough of 70cm and cut circular pancakes of radius 7cm each. What is the area of the remaining dough?
15. Find the number of square tiles that will fit when placed in a room 5m by 3m
16. A rectangular room 8m by 5m is to be covered with square tiles 20cm each.
17. How many tiles will be required to cover the floor of the room.
18. If the cost of a box of 20 tiles is shs.27000, what will be the cost required to buy all tiles needed for the room?

Reference : Fountain primary maths bk 7 page 351 – 383

Understanding math bk 7 page 192 – 197

Supplementary math bk 6 , 7 and 8 page 92 – 95

**TOTAL SURFACE AREA OF PRISMS**

* Drawing nets of prisms and making models
* Identifying cross-sections
* Describing why a particular prism is named so
* Working out area of various shapes that form the prism
* Finding total surface area of prisms

Note: 1) Prism is a solid which has 2 faces (ends or bases) that are identical and parallel to each other.

2) A prism has the same cross –section throughout its length and it’s named according to its cross-sectional area.

Total surface area – is the total area of the surface of the three dimensional objects (solid)

A ] SQUARE BASED PRISM (CUBE)

Properties

1. 6 square faces
2. 12 edges
3. 8 vertices

Note: There other forms for the net of a cube.

Example : Find the total surface area of a closed cube whose one side is 3cm.

Surface area of a closed cube

= area of one square face x 6

= (3cm x 3cm) x 6

= 9 cm2 x 6

= 54cm2

Note: 1) Total surface area = 6L2 where L is the side.

2) For an open cube at one end , total surface area = 5L2.

Exercise

1. Find the total surface area of closed cubes whose one side is;
2. 11dm b) 10mm c) 9hm
3. Find the total surface area of an open cube whose one side is;
4. 12dm b) 15mm c) 0.2m
5. The total surface area of a closed cube is given below. Find the length of each side and work out the volume.
6. Find the volume of an open cube whose surface area is
7. 45dm2 b) 180cm2  c) 60mm2
8. The perimeter of the edges of a cube is 72cm. Find the surface area of the cube.
9. Find the amount of wrapping paper needed for a gift below.

**RECTANGULAR BASED PRISM (CUBOID)**

Properties

1. 6 rectangular faces
2. 12 edges
3. 8 vertices

Example : Find the surface area of a closed cuboid which measures 6cm by 5cm by 4cm.

Area of front and back = 2 x (6cm x 4cm)

= 2 x 24cm2

= 48cm2

Area of top and bottom = 2 x 6cm x 5cm

= 2 x 30cm2

= 60cm2

Area of sides (left and right) = 2 x 5cm x 4cm

= 2 cm x 20cm2

= 40cm2

Total surface area

= 48cm2 + 60cm2 + 40cm2

= 148cm2

In short : = 2(L x W) + 2(L x H) + 2(W x H) OR 2[(LW) + (LH) + (WH)]

Or (Perimeter of end x length) + (Area of ends)

Example : Fid the total surface area of an open cuboid below.

Area of bottom alone = 6cm x 5cm

= 30cm2

Area of front and back = 2 x 6cm x 4cm

= 2 x 24 cm2

= 48cm2

Area of sides (left and right) = 2 x 5cm x 4cm

= 2 x 20cm2

= 40cm2

Total surface area = 30cm2 + 48cm2 + 40cm2

= 118cm2

In short : T.S.A of an open cuboid

= (L x W) + 2(L x H) + 2(W x H)

Note : We normally apply this idea of total surface area of a cuboid on a room which has a floor , ceiling and 4 walls.

Example : A room is 45m long 20m wide and 15m high. The doors and windows occupy an area of 14m2. What is the surface area of the walls?

Area of front and back

Longer walls

= 2 x 45m x 15m

= 2 x 675m2

= 1350m3

Area of side walls or shorter walls

= 2 x 20m x 15m

= 2 x 300m2

= 600m2

Area of 4 walls = 1350m2 + 600m2

= 1950m2

Area of walls only = (1950 – 14)m2 = 1936m2

Note : When the walls are spread

This area of 4 walls = perimeter of bottom x height

(without doors and windows ) = 130m x 15m

= 1950m2

Or (LxH) + (L x H) + (W x H) + (W x H)

= 2LH + 2WH

Distributed as 2H (L + W) for area of 4 walls

= (2 x 15m) x (45 + 20)m

= 30m x 65m

= 1950m2 (without windows)

**Exercise**

1. Find the total surface area of closed cuboids below.
2. Find the total surface area pf the cuboids open at the top.
3. The total surface area of the cuboid below is 94cm2. Find its height.
4. An open tank 2m long, 1.6m wide and 0.5m high is full of water. Find the area of the rank.
5. A room is 5m long , 4 m wide and 3.5m high. Calculate the cost of painting the walls and the ceiling at sh 4500 per m2.
6. A litre of paint covers an area of 16m2. How many litres will be required to paint the four walls and the ceiling of a nursery school building 12 m , 8m and 4 m high.

Reference : Supplementary math bk 6 , 7 and 8 page 96.

**TRIANGULAR PRISM**

It has 2 triangular faces and 3 rectangular faces.

Net of the triangular prism

Properties

- 6 vertices

- 9 edges

- 5 faces

Note : The cross section is a triangle – it can be equilateral , isosceles , scalene or right (angled) triangle respectively.

Example : Find the total surface area of the prism below.

Solution: Area of 2 triangles + area of 3 rectangles

=

= ( x 6cm x 4cm) + ( x 6cm x 4cm) + (10cm x 8cm) + (10cm x 6cm) + (10cm x7cm)

= 24 cm2 + 21cm2

= 234cm2

Note : Total surface area can also be determined by multiplying the perimeter of the cross – section by the lateral length.

= (6cm + 7cm + 8cm) x length (10cm)

= 21cm x 10cm

= 210cm2

Or (s1 + s2 + s3 of ⧊) x L (length)

Example : Find the total surface area of the wedge shown below.

Note : Find the missing side of the triangle (right angled) using Pythagoras theory.

a2 + b2 = c2

(12cm)2 + (5cm)2 = c2

144cm2 + 25cm2 = c2

√169 cm2 = √c2

13cm2 = c

Now total surface area

= (base x height) + Length (Perimeter of ⧊) or (area of 2 triangles)

= (12cm x 5 cm) + 10cm (5cm + 12 cm + 13cm)

= 60cm2 + (10cm x 30cm)

= 60cm2 + 300cm2

= 360cm2

**Exercise:**

1. Find the total surface area of the wedges below.
2. Find the missing side of the triangular cross-section , then find the total surface area.
3. In the prism AB = 2cm , BC = 1.6cm.
4. Find the length AC
5. Find the total surface area if AD = 6cm
6. The figure below represents a net of a triangular prism.
7. Find the total surface area of the net.
8. Calculate the volume of the solid when closed up to form a solid.
9. In the figure below , XPRW is a square. Calculate the total surface area of the entire figure.

Reference : Mk bk 7 page 400 - 401

Supplementary math page 96

Functional maths 6 , 7 and 8 page 9293 – 294

CYLINDER (CIRCULAR BASE PRISM)

Net of a cylinder

A cylinder has three faces , two circular faces (circle or ends) and the rectangle (curved surface)

N.B. The rectangle has the same height as the cylinder (width)

The length of the rectangle must be just enough to wrap around the circle (circumference)

Example : Find the surface area of the closed cylinder below.

Using diameter : for circumference

= πDH + πr2

= ( x 14 x 20)cm2 + (2 x x 7cm x 7cm)

= 880cm2 + 308cm2

= 1188cm2

Using radius

πr2 + 2πrh + πr2

( x 7cm x 7cm) + (2 x x 7cm x 20cm) + ( x 7cm x 7cm)

= 154cm2 + 880cm2 + 154cm

= 1188cm2

Example : Find the surface area of an open cylinder below at one end.

Total surface area of an open cylinder

= curved surface + area of the circle

= 2πr / TLDH + πr2

= (2 x x 7dm x 10dm) + ( x 7 x 7) dm2

= (4 x dm x 10dm) + (154)dm2

= 440dm2 + 154dm2

= 594dm2

Example : Find the surface area of the cylinder open at both ends.

Note : In this case , we simply find the area of the curved surface.

= 2 πrh or TLDH or x 14cm x 20cm

= 2 x x 7cm x 20cm = (44 x 20)cm2

= 44cm x 20cm = 880cm2

= 880cm2

GUIDED PRACTICE

1. Find the surface area of the following cylinders closed at both ends.
2. Work out the total surface area of the cylinders below which are open at the top.
3. Find the surface area (curved surface) of cylinder open at both ends. (Hollow cylinder)

**TRAPEZOIDAL PRISM**

It has two trapezium faces and 4 different rectangular faces all connected to the lateral length.

Total surface area

= (perimeter of trapezium) x Length

= (7cm + 4cm + 6cm + 5cm) x 10cm

= 22cm x 10cm

= 220cm2

Exercise

Find the total surface area of the trapezoidal prism below.

Reference:

Fountain primary math bk 7 pg 379 – 401

Mk book 7 page 400 – 401

Understanding math bk 7 pg 207 – 211.

**VOLUME**

Volume is the amount if space occupied by a three dimensional shape. Volume is measured in cubic units.

**VOLUME OF A TRIANGULAR PRISM**

**Teaching / learning activities**

* Identifying the shape of the cross-section
* Calculating the shape of the cross-section
* Identifying the uniform length through the solid.
* Finding the volume of the triangular prism.

Example : Find the volume of the prism below.

Volume = area of the cross-section x length (height)

= triangular cross-section x height

= ( x b x h) x ℓ

= ( x 12 cm x 6cm) x 10cm

= 36cm2 x 10cm

= 360cm3

Exercise:

1. Find the volume of the prisms below.
2. The volume of the cross-section in each below is given. Find the volume.
3. Find the missing side of the prism below and then the volume.
4. A tent has triangular ends of base 8m and height 6m and is 8.5m long. Calculate the volume of air in the tent.
5. The figure shows a triangular trench which is dug out. It the trench is 10m long and its ends are triangles of base 60cm and depth (height) 80cm. calculate the quantify of earth removed in digging it. Give your answer in cubic metres.
6. Calculate the volume of a triangular prism below.
7. The volume of the triangular prism is 2880cm3. Calculate the value of m.
8. Calculate the length of the triangular prism with base 12cm and height 5cm and volume of 450cm3.

References : Mk bk 7 page 400.

Preparatory mathematics page 84 – 85

Supplementary math bk 6 , 7 and 8 page 98

Functional math bk 7 page 293 – 294

Fountain maths bk 7 page 399 – 401

**VOLUME OF TRAPEZOIDAL PRISM**

**Teaching / learning activities**

* Identifying the shape of the cross – section
* Calculating area of the cross – section
* Identifying the uniform length through the grid.
* Finding the volume of the trapezoidal prism

**Example** : Find the volume of the trapezoidal prism below.

Volume = area of the cross section x height

Cross- section is a trapezium

Volume = h (a + b) x ℓ

= x 4cm2 (6cm + 9cm) x 10cm

= 2cm x 15cm x 10cm

= 30cm2 x 10cm

= 300cm3

Exercise

1. Calculate the volume of trapezoidal prism below.
2. Study the trapezoidal prisms below and find the volume.

References : Mk bk 7 page 401

Understanding math bk 7 page 207 to 211

Functional math bk 7 page 293 – 294

**VOLUME OF A CYLINDER**

Teaching / learning activities

Identifying the shape of the cross-section

Calculating the area of the material to form cylinder

Identifying uniform length through the solid

Finding the volume of the prism.

Examples: Find the volume of the cylinder below.

Volume : Base area x height

= (area of circle) x height

= πr2h x h

= ( x x )cm2 x 10cm

= 154cm2 x 10cm

= 1540cm3

**Exercise:**

Note: when given diameter, you start by finding the radius.

1. Calculate the volume of the cylinder below. (Take π = )
2. Calculate the volume of the cylinders below. (take π = 3.14)

Note : Find the volume of half cylinders.

1. The volume of a cylinder is 308cm3. Find its height if the cross-section has an area of 38.5cm2.
2. Calculate the height of the cylinder whose volume is 1694m3. If a cylinder has the radius of 7m.
3. Find the radius of the cylinder whose volume is 62.8cm3 and height of 5cm. (take π = 3.14)
4. A cylindrical tin has a circumference of one circular face 88cm and height of 50cm. what is the volume of the cylindrical tins?
5. The volume of a cylindrical can is 12560cm3 and has a height of 10cm. calculate its radius. (take π = 3.14)

ii) A cylindrical tank has a volume of 550cm3 and height of 7cm. Find its radius.

(Use π = )

1. A cylindrical tank 1m 40cm in diameter contains 3080 litres of water. Find the depth of water in the tank.
2. The radius of a cylinder is 7cm. If its volume is 3080cm3. Find its height.

Reference : Preparatory mathematics page 84

Mk bk 7 page 402

Moran mathematical formulas and terms page 140 – 141

Supplementary math page 97 – 98.

**DIFFERENCE IN VOLUME**

**Teaching / learning activities**

* Identifying the cross-section
* Identifying formular for different cross-sections
* Finding volume of inner and outer figures
* Subtracting volume of inner and outer figure

**Example:**

The figure shows a cylindrical hollow pipe. Find the volume of the pipe.

20cm

14cm

7cm

Volume of whole figure (outer cylinder)

= x 7cm x 7cm x 20cm

= 154cm2 x 20cm

= 3080cm3

Volume of hollow (inner cylinder)

= x x x 20

= 77 x 10

= 770cm3

Volume of the pipe = 3080cm3 – 770cm3

= 2310cm3

Exercise : Find the volume of the concrete in cylinder below.

8cm

7cm

14cm

2) The figure shows a cylindrical hollow pipe of concrete 3m long. Calculate the volume of the concrete.

3) The cylindrical pipe of wood after drilling a hollow in it. Calculate the volume of the wood left after drilling the hollow.

4) Find the volume of the concrete below.

f) Find the volume of the metal which makes up the pipe.

**EXTRA WORK (CAPACITY – CYLINDERS)**

1. Find the volume of the cylindrical tanks in litres.

3m

140m

100cm

140cm

80cm

70cm

a) b) c)

8m

7m

7cm

140cm

100cm

140cm

d) e) f)

2m

280m

g)

2. Find the volume if the tank for each and the remaining litres needed to make the tanks full.

100cm

120cm

140cm

70cm

100cm

21cm

20cm

60cm

140cm

a) b) c)

d) e) f)

35cm

28cm

100cm

130cm

100cm

140cm

6cm

80cm

35cm

3. The volume of the tank below is 1540litres.

100cm

a) Find the radius

b) Find the capacity when full.

4. A cylindrical tin with a circumference of one face 88cm and height of 50cm is full of water.

50cm

a) What is the volume of water in the tin in litres

b) If 10.78 litres are removed, find the new height of

water in the tank.

5. A welder was given metal sheet whose measurements are shown as below in the diagram. He welded it into a hollow cylinder making a height of 100cm.

440cm

100cm

a) What is the surface area of the sheet needed to cover the bottom of the cylinder.

b) What maximum volume of water will the cylinder hold?

6. The figure below is a cylindrical tank full of petrol.

140cm

210cm

a) Calculate the surface area of the two circular faces.

b) If the above tank is full of petrol, calculate the cost of petrol at sh. 3500 per litre.

7. A cylinder with radius 7cm contains 2926cm3 of liquid soap. (Take π = )

(i) If 616cm3 of the liquid soap is used, what is the height of the liquid soap remaining?

(ii) If the 616cm3 was poured into a rectangular tin with base area of 88cm2, what height will the liquid soap rise?

8. A cylindrical tin of radius 7cm contains 3050cm3 of cooking oil. Joan used 2156cm3 of cooking oil. What is the height of the cooking oil remaining in the tin?

b) Joan poured the remaining cooking oil into a rectangular tin with base area 77cm2. What was the height of the oil in the tin?

9. The circumference of the shaded face is 88cm.

10cm

a) Calculate the radius of the cylinder

b) Calculate the volume of the cylinder

c) Calculate the surface area of the cylinder.

10. The base area of a cylindrical container A is 154cm2 and the height is 20cm. a container B holds 4000ml of water. If the water of container B is used to fill container A, how much water remains in container B? (Filling small and big containers)

11. Calculate the volume of the cylinder

3(p+10)cm

2(p+4)cm

(p+6)cm

**CAPACITY**

The capacity of a container is the volume of liquid that it will hold. Capacity is sometimes measured in the same units as volume. (Cubic centimeters or cubic metre) but more often it is measured in litres.

Note : 1 litre = 1000cm3

1 m3 = 1000ℓ

1 mℓ = 1cm3

Teaching / learning activities

Comparing a cube (10cm) with a bottle container of 1 litres.

Finding the conversion rate between litres and cubic centimetres, 1m3 with 1000 litres and 1000ml and 1000cm3

Find capacity in litres and solving related problems.

Example : Find the volume / capacity of the following in litres.

4m

2m

3m

60cm

40cm

50cm

1. b)

Volume = L x W x H V = L x W x H

= 60cm x 40cm x 50cm = 4m x 3m x 2m

= 120000cm3  = 24m3

But 1000cm3 = 1 litre

1cm3 = ( ) litres 1m3 = 1000ℓ

120000cm3 = () litres 24m3 = (24 x 1000) ℓ

= 120litres = 24000 ℓ

Or 400 x 300 x 200

= (24,000,000)cm3

In litres = ( )

= 24000litres

N.B. The tank is full. a) How many litres are in the tank?

80cm

60cm

70cm

h

b) Find the height of h.

c) How many litres are needed to fill the tank?

Note : Units can be changed to centimetres for convenience.

N.B: The tank below has 72 litres of water.

a) Find the value of h.

40cm

h

60cm

80cm

b) How many litres are needed to fill the tank.

**Activity.**

30cm

1. Find the volume / capacity of the rectangular tank below in litres.

90cm

50cm

1m

a) b) c)

100cm

40cm

20cm

40m

50m

30m

1. Find the capacity of the tanks below in litres.

8m

3m

9.2m

6m

5m

7m

4m

3m

1m

1. The volume of the water in the tank is 0.72 litres. Find the value of h.

30cm

40cm

h

1. The tank below is full of water, how many litres does it hold when full.

80cm

60cm

40cm

1. The solid cuboid below has a square base. It contains 80 litres when full of water. Calculate the value of a.

a

a

50cm

1. The tank given holds 54 litres. Calculate the value of h.
2. Calculate the value of h

40cm

30cm

h

1. If the tank is full of water, how many litres does it hold when full?
2. What is the actual height of the tank?
3. How many more litres are needed to fill the tank?
4. The tank is full of water.

80cm

50cm

70cm

1. How many litres are in the tank?
2. Find the height of h.
3. How many more litres are needed to fill the tank?
4. The tank of fuel has 96litres.
5. Find the height of the fuel in the tank.

40cm

50cm

80cm

b) How many litres are needed to fill the tank?

1. A rectangular water tank has a capacity of 60 litres. Calculate
2. The water tank below is full of water.
3. Find its capacity when full.
4. Find its height

40cm

90cm

30cm

1. A tin with base 30cm by 20cm contains water to adepth of 18cm. the water is poured into another tin with a square base of side 20cm. what is the depth of the water in the second tin. (comparing volume)