REPUBLIC OF SOUTH SUDAN

PASTORAL LIVELIHOODS AND EDUCATION FIELD SCHOOLS (PLEFS) APPROACH

Mathematic
Learner's Book 4

MINISTRY OF GENERAL EDUCATION AND INSTRUCTION

2017

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UNIT 1: NUMBERS

1. Write the following in words:

   (a) 10 001 (c) 15 046

   (b) 73 205 (d) 99 999

2. What is the place value of digit 3 in each of the following numbers?

   (a) 78 354 (b) 26 003

   (c) 35 866 (d) 53 418

3. Write the following numbers in symbols:
   (a) Sixty four thousand three hundred and seventy eight.
   (b) Forty eight thousand nine hundred and nine
   (c) Twenty five thousand and two
   (d) Eighty one thousand and ninety.

4. Write the next number after each of the following numbers:
   (a) 999
   (b) 34 299
   (c) 9 999
   (d) 19 999
   (e) 99 009
5. Write the number just before each of the following: (a) 8 000 (b)61 710
   (a) 8 000
   (b) 61 710
   (c) 25 000
   (d) 62 200
   (e) 49 000

1. What number comes after 99 999?

   99 999 + = 100 000

   100 000 Written in words is one hundred thousand.

2. Count the first five numbers after 100 000.

   The numbers written in symbols and words are:

   100 001 One hundred thousand and one

   100 002 One hundred thousand and two

   100 003 One hundred thousand and three

   100 004 One hundred thousand and four

   100 005 One hundred thousand and five

1. Write in symbols and in words.

I.	100 000	One hundred thousand
II.	200 000	_____
III.	_____	Three hundred thousand
IV.	400 000	_____
V.	500 000	_____
VI.	_____	Six hundred thousand
VII.	_____	Seven hundred thousand
VIII.	800 000	_____
IX.	900 000	_____

2. Fill the missing numbers.

(a)	110000	120000	130000	_____	_____
(b)	240 000	250 000	_____	270 000	_____
(c)	550 000	560 000	_____	_____	590 000
(d)	870 000	_____	890 000	900 000	_____
(e)	900 000	910 000	_____	_____	940 000

1. Read the number and write in words.

(a) 120 000 One hundred and twenty thousand

(b) 250 000 _____

(c) 370 000 _____

(d) 810 000 _____

(e) 940 000 _____

(f) 790 000 _____

Place value

462 135: 4 hundreds of thousands 6 tens of thousands

2 thousands 1 hundreds 3 tens and 5 ones

Number in words

410 723: Four hundred and ten thousand seven hundred and twenty three.

Number in symbol

Seven hundred and eight thousand two hundred and thirty six: **708 236**

1. Complete the table below.

Number in Words	Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Ones
Six hundred and seventy thousand and ninety nine	_____	_____	_____	_____	_____	_____
Four hundred and five thousand and three	_____	_____	_____	_____	_____	_____
One hundred and seventeen thousand and ten	_____	_____	_____	_____	_____	_____
Nine thousand, nine hundred and nine	_____	_____	_____	_____	_____	_____

2. Write the following numbers in words.

   (a) 479 635 (b) 800 419

   (b) 666 814 (d) 912 053

3. Write the following numbers in symbols.
   a. Three hundred thousand and two
   b. Seven hundred and seventy seven thousand, seven hundred and seven
   c. Eight hundred and one thousand and thirty
   d. One hundred and fifty four thousand and six
   e. One hundred thousand and nine

Total value of digits in numbers

In the number 289 375, the value of the digit;		
2	is	200000
8	is	80 000
9	is	9 000
3	is	300
7	is	70
5	is	5

1. Write the total value of the digits in each number:

   (a) 574 081 (b) 134653

   (c) 309781 (d) 624 390

2. What is the total value of the digit 4 in the numbers:

   (a) 621 439 (b) 743192 (c) 467815

   (d) 921 384 (e) 354703

Rounding off numbers

ROUNDING OFF TO THE NEAREST TEN

SAME TEN	digits in the ones place value									NEXT TEN
	1	2	3	4	5	6	7	8	9	

← TO THE SAME TEN | TO THE NEXT TEN →

Examples

(a) 20 ← Round off to ← 24 → 26 ← Round off to → 30

(b) 70 ← Round off to ← 74 → 76 ← Round off to → 80

(c) 50 ← Round off to ← 52 → 45 ← Round off to → 50

Round off the numbers in questions 1, 2 and 3 to the nearest 10:

1. (a) 19 (b) 21 (c) 38 (d) 56 (e) 63 (f) 77 (g) 45 (h) 11 (i) 8 (j) 81 (k) 79 (I) 74
2. (a) 129 (b) 133 (c) 255 (d) 266 (e) 811 (f) 809 (g) 458 (h) 376 (i) 651 (j) 987 (k) 522 (I) 109
3. (a) 25 (b) 125 (c) 76 (d) 421 (e) 44 (f) 777 (g) 99 (h) 94 (i) 968 (j) 111 (k) 13 (I) 213 (m) 5021 (n)9249 (0)989 (p) 8888
4. Write down the following numbers in symbols to the nearest ten:
   (a) Sixty nine
   (b) One hundred and forty one
   (c) Four thousand and nine
   (d) Three thousand six hundred and seventy two.

1. Round off the following numbers to the nearest hundred:

   (a) 867 (b) 255 (c) 350 (d) 907 (e) 91 (f) 2682

   (g) 149 (h) 38 (i) 504698 (j) 97213 (k) 5084 (I) 999

2. Round off the following numbers to:
   i) the nearest 10
   ii) (ii) the nearest 100

   (a) 139 (b)74 (c) 333 (d) 19990 (e) 20 (f) 51

   (g) 601 (h) 501 948 (i) 222 (j) 849 (k) 90 008

UNIT 2: OPERATIONS ON NUMBERS

Addition

1.
$$\begin{array}{r} 173 \\ +26 \\ \hline \\ \hline \end{array}$$

2.
$$\begin{array}{r} 88 \\ 25 \\ +\ 64 \\ \hline \\ \hline \end{array}$$

3.
$$\begin{array}{r} 9\,462 \\ +6\,785 \\ \hline \\ \hline \end{array}$$

4.
$$\begin{array}{r} 39\,265 \\ +21\,878 \\ \hline \\ \hline \end{array}$$

5.
$$\begin{array}{r} 62\,487 \\ 21\,304 \\ +14\,956 \\ \hline \\ \hline \end{array}$$

6.
$$\begin{array}{r} 42\,761 \\ +40\,989 \\ \hline \\ \hline \end{array}$$

83 949 + 34 625 + 28

Align the numbers vertically

$$\begin{array}{r} 83\,949 \\ 34\,625 \\ +\quad 28 \\ \hline 118\,602 \\ \hline \end{array}$$

In a certain constituency 61 951 women and 43 280 men voted.

How many people voted altogether?

Number of women who voted	61 951
Number of men who voted	+ 43 280
Total number of people who voted	105 231

1. A factory produced 384 795 iron sheets in January. It then produced 463 500 iron sheets in February. How many iron sheets did the factory produce in the two months?
2. A milk processing factory produced 240 000 packets of milk in one week, and 98 000 packets the following week. How many packets of milk were produced in the two weeks?

Multiplication

617 to the nearest ten is 600

X 45

45 to the nearest ten is 50

600 x 50 = 30 000. This product has 5 digits.

∴ The product of 617 and 45 wilt be a 5-digit number.

i.e. 617

$$\begin{array}{r} 617 \\ \times\ 45 \\ \hline 3\,085 \\ 24\,680 \\ \hline 27\,765 \end{array}$$

This Product has 5 digits.

1. (i) By rounding off, find the number of digits each product will have,
   (ii) Find the accurate answer for each problem.

(a) $\begin{array}{r} 539 \\ \times\ 74 \\ \hline \\ \hline \end{array}$

(b) $\begin{array}{r} 712 \\ \times\ 58 \\ \hline \\ \hline \end{array}$

(c) $\begin{array}{r} 259 \\ \times\ 46 \\ \hline \\ \hline \end{array}$

(d) $\begin{array}{r} 40\,322 \\ \times\ \ \ 7 \\ \hline \\ \hline \end{array}$

(e) $\begin{array}{r} 782 \\ \times\ 37 \\ \hline \\ \hline \end{array}$

(f) $\begin{array}{r} 3\,019 \\ \times\ 23 \\ \hline \\ \hline \end{array}$

2. A train had 47 coaches. Each coach carried 127 people. How many people were there in the train?
3. Jury workers carried 274 bricks each trip. They made 34 trips. How many bricks to the nearest 100 did the workers carry?
4. Deng can type 45 words per minute. How many words can he type in 45 minutes?
5. In a class there were 42 pupils. If each pupil planted 15 trees, how many trees were planted altogether?

1. (a) 3 x 2 = (b) 4 x 3 =
2. (a) 5 x 4 = (b) 6 x 5 =
3. (a) 7 x 6 x 3 = (b) 8 x 7 x 4 =
4. (a) 9 x 8 x 1 = (b) 6 x 9 x 5 =

1) 127 X 24

2) 193 X 19

3) 317 X 14

4) 347 X 34

5) 401 X 13

6) 469 X 37

7) A school bought 54 cartons of exercise books. Each carton contained 360 exercise books. How many exercise books did the school buy?

1) 129 X 90

2) 6 919 X 8

3) 819 X 25

4) 3 787 X 29

5) 7 930 X 39

6) 4 370 X 62

7) 9 999 X 37

8) 14 081 X 71

9) 27 144 X 36

10) 50 724 X 18

1) A shopkeeper bought 912 crates of soda. There are 24 bottles in each crate. How many bottles of soda did the shopkeeper buy?

Division: By multiples of 10

1. (a) 100 ÷ 10 = (b) 120 ÷ 10 = (c) 180 ÷ 10 = (d) 140 ÷ 10 =
2. (a) 800 ÷ 20 = (b) 1200 ÷ 40 = (c) 1080 ÷ 60 = (d) 5600 ÷ 80 =
3. Ten boys shared 240 mangoes equally. How many did each get?
4. A farmer planted 870 trees in thirty rows. How many trees did she plant in each row?

1. How many digits do you expect in the quotients of the following?

   (a) 7 000 ÷ 56 (b) 9 796 ÷ 78 (c) 8 233 ÷ 26

   (d) 4 784 ÷23 (e) 4 810 ÷ 45 (f) 752 ÷ 21

2. Divide:

   (a) 64 ÷ 3 (b) 275 ÷ 13 (c) 222 ÷ 22 (d) 134 ÷ 12 (e) 451 ÷ 11

Divisibility tests of 6 and 9

1. Which of these numbers are divisible by 2?

   102, 353, 2 221, 97, 5 000, 1 984, 1 106, 99, 333, 304.

2. Which of the numbers in question 1 above are divisible by 3?
3. Which of the numbers in question 1 above are divisible by 6?
4. Which of the following numbers are divisible by 9?

   54, 45, 39, 132, 333, 30 627, 1 818, 504.

5. From the numbers below, choose those which cannot be completely divided by 9:

   690, 62 172, 309, 1 008, 63.

6. Which of these numbers are multiples of 4?

442, 268, 3 016, 1 532, 152.

Prime numbers

1. Write down the divisors for each of the following numbers:

   11, 13, 15, 17, 19, 21, 31, 35, 42

2. Which of the numbers given in question 1 above are prime numbers?
3. List the prime numbers between 20 and 35.
4. Write down the following numbers as the sum of two prime numbers, e.g. 5 = 2 + 3;
   24= 11 + 13

   (a) 15 (b) 9 (c) 24 (d) 7 (e) 10 (f) 12 (g) 30 (h) 36 (i) 18 (j) 19

Prime factors

1. Use the factor tree method to find the prime factorization of the following numbers.

   (a) 24 (b) 64 (c) 84 (d) 48 (e) 79

2. Write down the prime factorization for each of these numbers:

   30, 32, 75, 81, 90, 99, 100 , 153.

UNIT 3: DIVISORS (FACTORS)

1. Fill in the missing factors in each of the following:

(a) 24 = 6 x ___

(b) 36 = 4 x ___

(c) 54 = 9 x ___

(d) 63 = 3 x ___

(e) 72 = 4 x __ x ___ x ___

2. Express the following as a product of two factors only:

(a) 12 (b) 18 (c) 15 (d) 25 (e) 27 (f) 48 (g) 72

(h) 21 (i) 32 (j) 64

GREATEST COMMON DIVISOR (G.C.D.) OR HIGHEST COMMON FACTOR (H.C.F.)

1. Write down the divisors of the following numbers:

(a) 24 (b) 28 (c) 36 (d) 39 (e) 42 (f) 48

(g) 54 (h) 66 (i) 60 (j) 75

2. Write down the common divisors of:

(a) 24 and 28 (b) 36 and 39 (c) 42 and 48 (d) 54 and 66

(e) 60 and 75

3. Find the greatest common divisors of each of the following pairs of numbers:

(a) 6 and 9 (b) 4 and 8 (c) 3 and 6 (d) 8 and 12 (e) 10 and 15

(f) 18 and 12 (g) 24 and 18 (h) 18 and 21 (i) 15 and 18

To find the G.C.D. **using prime factorization**

Find the G.C.D of 180, 360 and 630.

(i) Express 180, 360 and 630 as product of prime factors.

180 = 2 X 2 X 3 X 3 X 5

360 = 2 X 2 X 2 X 3 X 3 X 5

630 = 2 X 3 X 3 X 5 X 7

From the prime factorization of each number pick prime factors that occur in all prime factorizations;

Thus, 2 occurs at least once

3 occurs twice

5 occurs once

The G.C.D. of 180, 360 and 630 is 2 X 3 X 3 X 5 = 90

1) Find the G.C.D. of the following numbers, using the prime factorization method:

(a) 54 and 90 (b) 72 and 120 (c) 28, 42 and 56 (d) 45 and 60

(e) 220 and 360 (f) 42, 70 and 112 (g) 72, 84 and 108 (h) 84, 140 and 224

(i) 24 and 35

Multiples and least common multiples (L.C.M)

(a) List the multiples of 5 which are less than 50.

(b) List the multiples of 7 which are less than 70.

(c) List the multiples of 9 which are less than 100.

(d) List the multiples of 11 which are less than 120.

(e) List the multiples of 12 which are less than 140.

B. Common multiples of 4 and 5 which are less than 50.

Multiples of 4 are 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, …

Multiples of 5 are 5, 10, 15, 20, 25, 30, 35, 40, 45,...

Common multiples of 4 and 5 which are less than 50 are 20, 40,

(a) Write down the common multiples of 2 and 3 which are less than 20.

(b) Write down the common multiples of 4 and 8 which are less than 33.

(c) Write down the common multiples of 7 and 9 which are less than 72.

(d) Write down the common multiples of 4, 6 and 8 which are less than 33.

(e) Write down the first four common multiples of 3, 4 and 6.

C. Least common multiples (L.C.M.) by listing:

What is the L.C.M. of 4 and 6?

Multiples of 4 are: 4, 8, 12, 16, 20, 24, 28, 32, 36 ….

Multiples of 6 are: 6, 12, 18, 24, 30, 36 …..

Common multiples of 4 and 6 are: 12, 24, 36 …

The Least Common Multiple of 4 and 6 is 12

2. Write down the first four multiples of each of the following numbers:

(a) 6 (b) 13 (c) 8 (d) 15

D. Least common multiples using the short method

Find the L.C.M. of the following: (a) 4, 18 (b) 3, 10, 15

Start dividing by the smallest prime number that divides any of the numbers.

2	4, 18		2	3, 10, 15
2	2, 9		3	3, 5, 15
3	1, 9		5	1, 5, 5
3	3			1,1

L.C.M. of 4 and 18 is 2 x 2 x 3 x 3=36 L.C.M. of 3, 10 and 15 is 2 x 3 x 5 = 30

6. Use the method used in frame D above to find out the L.C.M. of the following:

(a) 7, 8 (b) 4,10 (c) 9, 12 (d) 12, 15 (e) 10, 15

(f) 12, 30 (g) 8,12, 30 (h) 6, 8, 9 (i) 5, 6, 7

PATTERNS

1. What is the next number in the patterns below?

(a) 5, 9, 13, 17, 21, 25, ____

(b) 20, 18, 16, 14, ____

(c) 23, 29, 31, 37, ____

(d) 0, 2, 4, 6, 8, ____

(e) 1, 2, 3, 5, 7, 11, ____

ROMAN NUMBERS

Hindu/Arabic Numerals	1	2	3	4	5	6	7	8	9	10
Roman Numerals	I	II	III	IV	V	VI	VII	VIII	IX	X

Hindu/Arabic Numerals	20	30	40	50
Roman Numerals	XX	XXX	XL	XL

Example 1 Write 19 in Roman Numerals,

19 is 10 and 9

The numeral for 10 is X

The numeral for 9 is IX

Therefore 19 is XIX

Example 2 Write 46 in Roman Numerals.

46 is 40 and 6,

The numeral for 40 is XL

The numeral for 6 is VI Therefore 46 is XLVl

1. Write down the following in Roman numerals:

(a) 16 (b) 29 (c) 38 (d) 47 (e) 49

2. Write the following in Hindu/Arabic numerals:

(a) XLV (b)XIV (c) XXXIX (d) XXVII (e) XIII

UNIT 4: FRACTIONS

Find the missing numbers in the following:

1. (a) $\frac{1}{2} = \frac{1 \times ?}{2 \times ?} = \frac{2}{2}$ (b) $\frac{1}{2} = \frac{1 \times ?}{2 \times ?} = \frac{3}{6}$

   (c) $\frac{1}{2} = \frac{1 \times ?}{2 \times ?} = \frac{4}{8}$ (d) $\frac{1}{2} = \frac{1 \times ?}{2 \times ?} = \frac{5}{10}$

2. (a) $\frac{3}{4} = \frac{?}{8}$ (b) $\frac{?}{3} = \frac{4}{6}$ (c) $\frac{1}{?} = \frac{3}{9}$

   (d) $\frac{1}{6} = \frac{2}{?}$ (e) $\frac{1}{2} = \frac{?}{4} = \frac{4}{?}$

Writing in the simplest form.

Simplify: (i) $\frac{2}{4}$ (ii) $\frac{18}{27}$

(i) $\frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2}$

(ii) $\frac{18}{27} = \frac{18 \div 3}{27 \div 3} = \frac{6}{9}$

$\frac{6}{9} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$

$\frac{18}{27} = \frac{18 \div 9}{27 \div 9} = \frac{2}{3}$

SIMPLIFYING BY CANCELLING

1. Use the short method to write the following fractions in their simplest form.

(a) $\frac{6}{10}$ (b) $\frac{9}{12}$ (c) $\frac{14}{21}$ (d) $\frac{15}{20}$ (e) $\frac{18}{21}$ (f) $\frac{15}{25}$

1. Simply the following fractions.

(a) $\frac{6}{8}$ (b)$\frac{3}{15}$ (c)$\frac{24}{42}$ (d)$\frac{12}{16}$ (e)$\frac{18}{24}$ (f)$\frac{18}{30}$

(g) $\frac{50}{100}$ (h)$\frac{36}{45}$

COMPARING FUNCTIONS

B. Arrange in order from the smallest to largest.

$\frac{3}{5}$, $\frac{2}{3}$, $\frac{1}{2}$ $\frac{3}{4}$

L.C.M of 5, 3, 2 and 4 is 60

$\frac{3}{5}=\frac{36}{60}$ $\frac{2}{3}=\frac{40}{60}$ $\frac{1}{2}=\frac{30}{60}$ $\frac{3}{4}=\frac{45}{60}$

$\frac{30}{60}$ $\frac{36}{60}$ $\frac{40}{60}$ $\frac{45}{60}$

(i.e) $\frac{1}{2}$, $\frac{3}{5}$, $\frac{2}{3}$, $\frac{3}{4}$

1. Arrange in order from the smallest to largest.

(a) $\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$

(b) $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{8}$

2. Add the following and give your answers in the simplest form.

(a) $1\frac{1}{8}+2\frac{5}{8}$ (b) $8\frac{1}{2}+1\frac{1}{4}$ (c) $2\frac{1}{3}+1\frac{1}{6}$ (d) $9\frac{1}{5}+2\frac{1}{2}$

(e) $6\frac{1}{3}+1\frac{1}{4}$ (f) $3\frac{1}{6}+7\frac{1}{3}$

Example 1:

$2\frac{5}{6}-1\frac{2}{3}=\ 2-1\ +\ \frac{5}{6}-\frac{2}{3}$

$=1+\frac{5-4}{6}$

$=1+\frac{1}{6}$

$=1\ \frac{1}{6}$

Example 2:

$5\frac{1}{3}-1\frac{1}{2}=\ 5-1\ +\ \frac{1}{3}-\frac{1}{2}$

$=4+\frac{2-3}{6}$

$=4+\ \frac{(2}{6}-\ \frac{3)}{6}$

(Take 1 from 4 and add it to $\frac{2}{6}$)

$=3+\ 1\frac{2}{6}-\ \frac{3}{6}$

$=3+\ \frac{(8}{6}-\ \frac{3)}{6}$

	$= 3 + \frac{5}{6}$ $= 3\frac{5}{6}$

Work out:

(1) $8\frac{7}{9} - 2\frac{4}{9}$ (2) $3\frac{1}{2} - 2\frac{5}{12}$ (3) $9\frac{7}{10} - 4\frac{2}{5}$ (4) $6\frac{3}{5} - 4\frac{1}{5}$

(5) $2\frac{7}{8} - 1\frac{3}{8}$ (6) $7\frac{2}{3} - 7\frac{1}{4}$ (7) $4\frac{1}{6} - 1\frac{6}{9}$ (8) $1\frac{3}{8} - \frac{5}{6}$

(9) $8\frac{1}{9} - 1\frac{1}{12}$

1. Copy and complete the following tables:

(a) Add

+	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{4}$
$\frac{1}{2}$				
$\frac{1}{3}$				
$\frac{1}{4}$			$\frac{11}{12}$	
$\frac{1}{6}$				

(b) Subtract

−	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$
$\frac{1}{2}$			
$\frac{2}{3}$			
$\frac{5}{8}$		$\frac{7}{24}$	

1. (a) $1\frac{3}{5} + \frac{4}{5}$ (b) $1\frac{1}{6} - \frac{5}{7}$ (c) $4\frac{7}{11} + 9\frac{1}{2}$

2. (a) $3\frac{1}{8} - 1\frac{5}{8}$ (b) $10\frac{1}{2} + \frac{1}{18}$ (c) $1\frac{3}{10} - \frac{7}{10}$

Multiply:

(i) $2\frac{1}{3} \times 4$

$2\frac{1}{3} \times 4 = \frac{7}{3} \times 4$

$= \frac{28}{3}$

$= 9\frac{1}{3}$

(ii) $6 \times 1\frac{3}{4}$

$6 \times 1\frac{3}{4} = 6 \times \frac{7}{4}$

3

$= \cancel{6} \times \frac{7}{\cancel{4}}$

2

Work out the following, giving your answers in the simplest form:

1. $3 \times 2\frac{1}{2}$
2. $2\frac{3}{5} \times 2$
3. $5 \times 1\frac{1}{3}$
4. $2\frac{2}{9} \times 4$
5. $2\frac{1}{10} \times 5$
6. $2 \times 1\frac{5}{6}$
7. $5 \times 2\frac{1}{7}$
8. $3\frac{4}{5} \times 4$

UNIT 5: LENGTH, PERIMETER AND AREA

LENGTH

1. Mary measured the length of the blackboard and it was the same size with a rope. One end of the rope was on the 1 cm mark and the other end on the 16 cm mark of the ruler. What was the length of the blackboard?
2. Estimate and then measure the lengths of the following objects and give answers to the nearest metre or centimetre:
   (a) Your Kitchen garden
   (b) The size of the PLEFS learning space

Example 1: Change 475 cm into metres.

100 cm = 1 metre

$$100 \overline{)\,475} \quad 4$$

$$-400$$

$$75$$

$$= 4\ \frac{75}{100}$$

$$= 4.75\ m\ o\ r 4\ \frac{3}{4}\ m$$

Example 2: Change 5 metres into centimetres,

5m = (5 x 100)cm

= 500 cm

1. Change these measurements into metres:

(a) 245 cm	(b) 425 cm	(c) 535 cm	(d) 140 cm
(e) 780 cm	(f) 340 cm	(g) 2 565 cm	(h) 5 010 cm
(a) 8m	(b) 13m	(c) 24m	(d) 207m
(e) 21 m	(f) 100m	(g) 105m	(h) $\frac{1}{2}m$

3. Change the following into Kilometres:

(a) 12 000 m (b) 30 000 m (c) 4 000 m (d) 18 000 m

Example 1: Add 3 km 450 m to 1 km 700 m.

Km	M
3	450
+1	700
5	150

450m + 700m= 1 150m

1 000 metres = 1 kilometre

1 150 metres = 1 kilometre and 150 m

Record 150 metres and carry over 1 kilometre.

Add the 1 kilometre to 3 km + 1 km,

i.e. 3 + 1 + 1 = 5 km

Example 2: Subtract 2 km 350 m from 4 km 240 m

Km	M
4	240
- 2	350
1	890

350 m is too big to be subtracted from 240 m. So borrow 1 km leaving 3 km. Convert the 1 km borrowed to metres and add 240 m to get 1 240 m.

Then subtract 350 m.

1 240
- 350
890

Subtract 2 km from 3 km to get 1 km.

Example 1: Multiply 3 km 275 m by 4

Example 2:

Km	M	cm
1	37	18
X		6
6	223	8

(i) 18 x 6 = 108cm

but 100 cm = 1 m

therefore 108 cm = 1 m and 8 cm.

Record 8 cm and carry over 1 m.

(ii) 37 mx 6 = 222 m

add the carried over 1 m to make 223 m

223 is less than a 1 000.

Record 223 in the m column,

(iii) 1 km x 6 = 6 km

Record 6 in the km column.

1.

m	cm
7	25
x	5

2.

Km	m	cm
12	27	38
X		9

3.

m	cm
2	20
x	8
13 km	100 m

1. (a) 24km 12cm ÷9 (b) 15m 20cm ÷ 4 (c) 46km 30cm ÷5

(d) 38 m 34 cm ÷ 6

2. (a) 3 km 500 m X 3 (b) 13 km 500 m ÷ 3 (c) 2 km 150 m 63 cm X 9

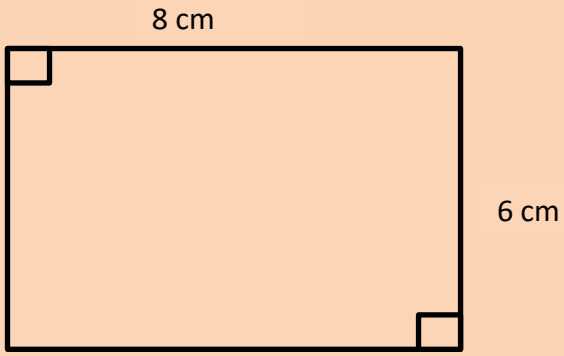
(d) 9 km 300 m ÷ 4 (e) 12km 725 m X 2 (f) 12km 950m ÷7

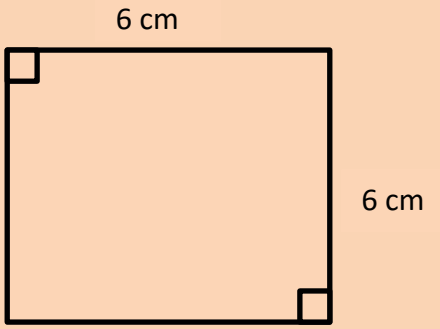
(g) 6 km 900 m X 7 (h) 23km 750m ÷5 (i) 34km 75 m X 12

(j) 59 km 600 m ÷ 8 (k) 6 km 50 m X 10 (l) 9km 90m 45 cm X 100

PERIMETER

Perimeter is the distance all the way round a figure.





Perimeter = 2 (length + width)

= 2 (8 + 6) cm

= 2 x14 cm

= 28 cm

Note: P= 2(L + W)

Perimeter = 2(6 + 6)

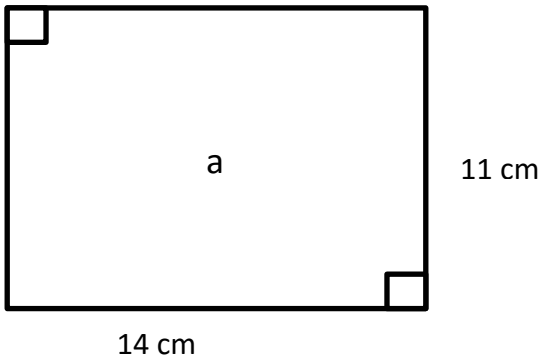
= 2 X 2 X 6

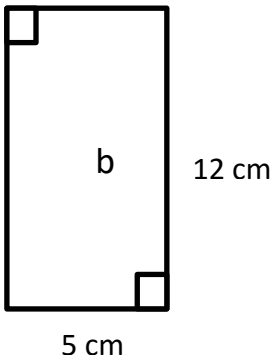
= 4 X 6

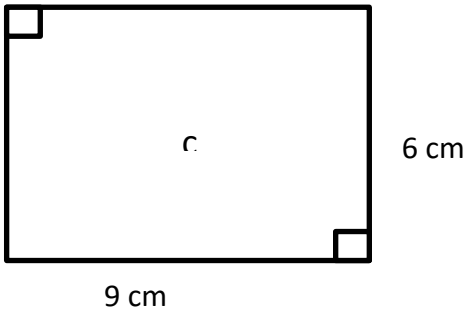
= 24

P= 4S

1. Use the formula P = 2(L + W) to find the perimeter of each of the figures below:







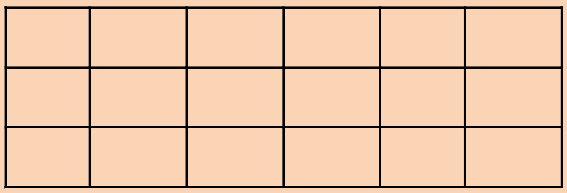
2. Calculate the perimeter of squares whose sides are:

(a) 13cm (b) 9cm (c)16cm (d) 14cm

AREA

Rectangle

A



Squares along the length are 6

Squares along the width are 3

Area = 6x3 = 18 sq. units

B

Length = 6 cm

Width = 3cm

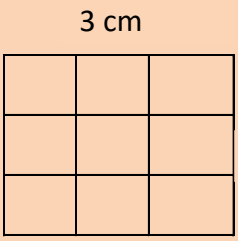
Area = L x W

= 6 cm x 3 cm

= $18cm^2$

Square

A



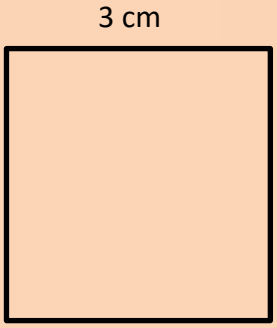
Squares along the side are 3

Squares along the other side are 3

Area = 3 x 3

= 9 sq. units

B



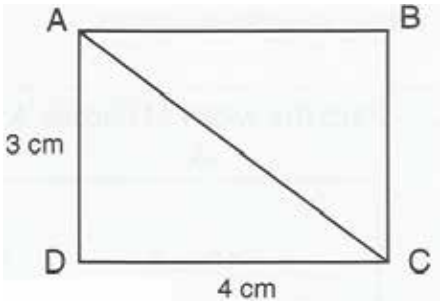
Side is 3 cm

Area = S x S

= 3 cm x 3 cm

= $9cm^2$

1. ABCD is a rectangle. What is its Trace the rectangle on a piece of paper and cut it out. Cut the paper along the diagonal AC.



(a) What is the shape of the two figures you get?

(b) What is the name of the largest angle in each piece?

(c) Can the two pieces fit exactly on top of one another? What does this tell us about the size of the two pieces and the size of the rectangle?

Area of the rectangle	=	$(3 \times 4)\ cm^2$
Area of any one triangle	=	$\frac{1}{2} \times (3 \times 4)\ cm^2$
	=	$\frac{1}{2} \times 12 cm^2$
	=	$6\ cm^2$

UNIT 6: DECIMALS

1 tenth	$= \frac{1}{10}\ 0.1$
1 hundredth	$= \frac{1}{100}\ 0.01$
1 thousandth	$= \frac{1}{1000}\ 0.001$

1. Fill in the given numbers in the place value table.

		thousands	hundreds	Tens	ones	tenths	hundredths	thousandths
a)	51.6			5	1	6		
b)	102.001							
c)	831.54							
d)	7.504							
e)	0.05							
f)	4 018.01							

Complete the following. The first one has been done for you.

(a) The place value of the digit 3 in 4.32 is tenths

(b) The place value of the digit 2 in 4.32 is _____

(c) The place value of the digit 5 in 35.327 is _____

(d) The place value of digit 5 in 327.35 is _____

CONVERSION OF FRACTIONS TO DECIMALS

1 tenth = $\frac{1}{10} = 0.1$

Write $\frac{7}{5}$ as a decimal

$$\frac{7}{5} \times \frac{2}{2} = \frac{14}{10} = 1.4$$

or 100 | 140 = 1.4

-100

40.0

-40.0

0

1 hundredth = $\frac{1}{100} = 0.01$

Write $\frac{17}{25}$ as a decimal

$$\frac{17}{25} \times \frac{4}{4} = \frac{68}{100} = 0.68$$

or 100 | 68.0 = 0.68

-60

8.0

-8.0

0

1 hundredth = $\frac{1}{1000} = 0.001$

Write $\frac{23}{40}$ as a decimal

$$\frac{23}{40} \times \frac{25}{25} = \frac{575}{1000} = 0.575$$

1. Write the following as decimals:

(a) $\frac{4}{10}$ (b) $\frac{6}{10}$ (c) $\frac{5}{100}$ (d) $\frac{25}{1000}$

Convert 0.375 into a fraction.

$$0.375 = \frac{375}{1000}$$

$$= \frac{375 \div 5}{1000 \div 5}$$

$$= \frac{75 \div 25}{200 \div 25}$$

$$= \frac{3}{8}$$

1. Write down as fractions

   (a) 0.75 (b) 0.075 (c) 0.625 (d) 0.45

2. Which is greater

   (a) $\frac{3}{5}\ o\ r 0.07$ (b) $\frac{1}{5} o\ r 0.075$ (c) $\frac{2}{5}\ o\ r 0.25$

3. Arrange the following in order starting from the smallest.

   (a) $0.22, \frac{1}{4}, 0.5$ (b) $\frac{3}{5}, 0.74, \frac{3}{4}, 0.25$ (c) $0.46, \frac{3}{10}, 0.09$

ADDITION AND SUBTRACTION OF DECIMALS

Work out the following:

1.

(a) 6.4 + 0.4 (b) 8.7 +2.5 (c) 7.2 +3.9 (d) 0.9 +2.3

(e) 8.6 -6.7 (f) 6.9 -3.5 (g) 4.0 -2.5 (h) 2.1 -1.2

2.

(a) 3.75 + 3.91 (b) 7.53 +3.77 (c) 4.89 +3.29 (d) 9.89 +6.29

(e) 6.25 -3.47 (f) 4.23 -1.6 (g) 3.91 -2.82 (h) 10.8 -8.98

Multiplication

(i) 0.4 x 4 = $\frac{4}{10} \times 4 = \frac{16}{10} = 1.6$	(ii) 70.23 x 14 $\frac{7023}{100} \times 14$ $= \frac{98322}{100}$ = 983.22	(iii) 136 x 0.015 $136 \times \frac{15}{1000}$ $= \frac{2040}{1000}$ = 2.040 or 2.04

1. Express the following decimals as fractions in their simplest forms:

(a) 0.8 (b) 0.4 (c) 0.15

(d) 0.72 (e) 0.99 (f) 0.1

2. Work out

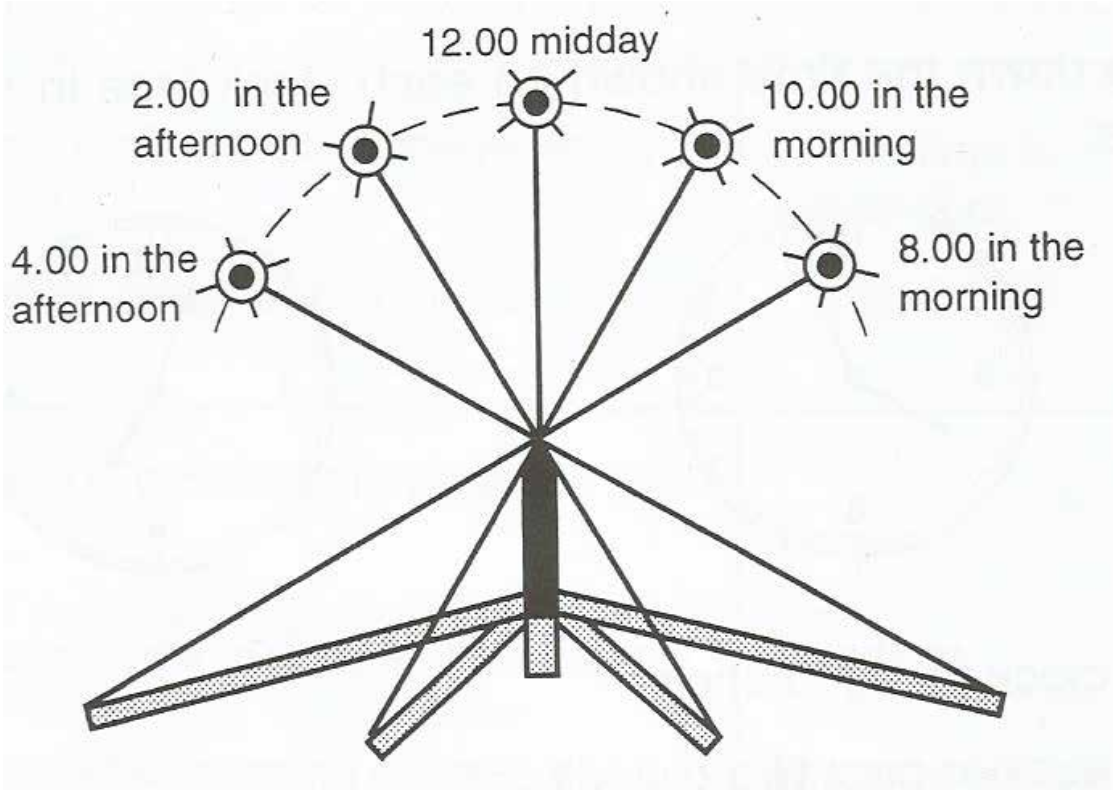
(a) 0.9 X 3 (b) 1.2 X 4 (c) 3.1 X 3 (d) 0.12 X 6

(e) 0.24X5 (f) 6 x 2.5 (g) 3.3 x 5 (h) 0.18 X 7

(i) 2.14 X 3 (j) 0.23 X 3 (k) 1.11 x 1 (l) 1.20 X 0

UNIT 7: TIME

ESTIMATING TIME BY SHADOWS



Copy and complete the following table.

TIME	LENGTH OF SHADOW	DIRECTION OF SHADOW
8.00 morning		
10.00 morning		
12.00 midday		
2.00 afternoon		
4.00 afternoon		

1. (a) When is the shadow longest?

   (b) What direction is it facing when it is longest?

TIME IN A.M AND P.M

Fill in the time in a.m., or p.m., or noon as given in the two examples below. Add other activities carried out in the cattle camp and at what time.

1. I am washing my face at 7.00 in the morning	The time is 7.00 a.m.
2. I am doing my taking cows back to the cattle camp at 7.00 in the evening	7.00 p.m.
1. The cows leave the cattle camp at 7.30 in the morning	Cows leave the cattle camp at _____
2. The PLEFS class for children starts at 3.00 in the evening.	It starts at _____
3. Women and girls go to fetch water at 10.00 in the morning.	They go at_____
4.	
5.	
6.	

1. Write down these times using a.m. and p.m.

   (a) Half past 10 in the morning (b) j to 11 at night

   (c) 3 o'clock in the afternoon (d) 4 o'clock in the morning

   (e) 5 minutes to 12 in the morning (f) 4 o'clock in the afternoon

2. The time now is 8.00 a.m. Copy and complete the following statements:

After 1 hour the time will be 9.00 a.m.

After 2 hours the time will be _____

After 3 hours the time will be _____

After 4 hours the time will be _____

After 5 hours the time will be _____

TIME IN SECONDS

1. Change the following into seconds:

(a) 5 minutes (b) 10 minutes (c) 18 minutes

(b) 45 minutes (e) 15 minutes (f) 3 minutes 30 seconds

CONVERSION OF FRACTIONS TO DECIMALS

Changing seconds to minutes:

(a) How many minutes are there in 180 seconds?

60 s = 1 min

180s = (180÷60) min

= 3 min

(ii) How many minutes and seconds are in 215 seconds?

60 s = 1 min

215s = (215÷60)s

= 3 min 35 s

OR

$$60 \overline{)\ 215} \quad 3 \text{ min rem } 35 \text{ s}$$

$$-180$$

$$35$$

∴215s = 3 min 35s

ADDITION

1.

	h	min
	3	35
	+2	15

2.

	h	min
	24	36
	+28	17

SUBTRACTION

Example 1

h	min	s
3	40	45
-1	20	30
2	20	15

Example 2

h	min	s
4	25	15
-2	15	30
2	9	45

(i) We cannot subtract 30 s from 15 s. We therefore borrow 1 min from 25 min and add to 15s

15 s + 1 min = 15 s + 60 s

=75 s

75 s - 30s = 45s

Record 45 s in the seconds column.

(ii) After borrowing 1 min from 25 min, we have 24 min left.

Now 24 min - 15 min

= 9 min

Record 9 min

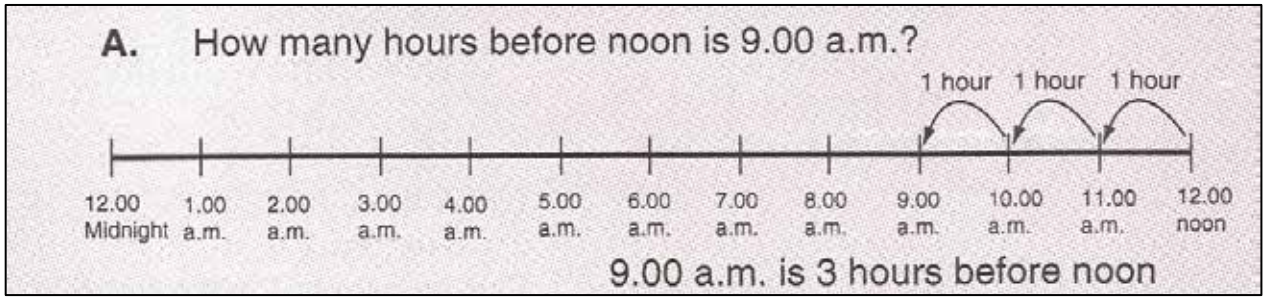
(iii) 4h-2h=2h, Record 2 h.

Our answer is 2 h 9 min 45 s

1.

h	min
10	35
-3	25

DURATION



1. How many hours before noon are the following times:

(a) 8.00a.m. (b) 10.00a.m.

(c) 11.00a.m. (d) 7.00 a.m.

(e) 2.00a.m. (f) 1.00a.m.

(g) 4.00 a.m. (h) 5.00 a.m.

2. How long is it from:

(a) 7.00 a.m. to 12.00 noon? (b) 8.00 a.m. to 11.00a.m.?

(c) 8.00 a.m. to 9.00 a.m.? (d) 1.00 a.m. to 11.00 a.m.?

MULTIPLICATION

1. Multiply 2 h 20 min by 5

h	min
20	20
x	5
11	40

1. Multiply minutes: 20 X 5 = 100
2. Convert: 100 min = 1 h 40 min
3. Record 40 min and carry over 1 h
4. Multiply hours: 2x5 = 10
5. Add hours: =10 + 1 = 11 h
6. Record 11 h

2. Multiply 3 min 45 s by 4

h	min
3	45
x	4
15	0

1. Multiply seconds: 45 X 4 = 180 s
2. Convert: 180 s = 3 min 0 s
3. Record 0 s and carry over 3 min
4. Multiply minutes: 3x4=12
5. Add minutes: 12 + 3=15
6. Record 15 min.

Multiply

1. 4 h 35 min x 4 **2.** 3 h 40 min X 5

3. 3 min 15 s X 10 **4.** 6 min 40 s X 9

DIVISION

1. Multiply 2 h 20 min by 5

```
        3 h 15 min
    6 | 19 h   30 min
      18 h
      1 h = 60 min
      90 min
      90 min
      0
```

1. Divide hours: 19÷6 = 3 rem 1
2. Record 3 h
3. Convert 1 h to min = 60 min
4. Add minutes: 30 + 60 = 90
5. Divide minutes: 90 ÷6 = 15
6. Record 15 min

2. Multiply 3 min 45 s by 4

```
        0 min 40 s
    7 | 4 min   40s
      0 min
      4 min =  240 s
      280 s
      280 s
      0
```

1. Divide minutes: 4 ÷ 7 is not possible
2. Convert 4 min to s: 4 x 60 = 240 s
3. Add seconds: 40 + 240 = 280
4. Divide seconds: 280 ÷7 =40
5. Record 40 s

Divide

1. 25 h 20 min ÷ 4
2. 4h 15 min ÷ 3
3. 5h 30 min ÷ 6
4. 6 min 40 s ÷ 8
5. 12 min 30 s ÷ 5
6. 50 min 10 s ÷ 7

UNITS 8: ALGEBRA

Collection and addition of like terms

1. Add:

(a) x + x (b) 9e + e (c) 7t + 5t

(d) m + 3m+ 2m (e) 2k + 3k + 10k (f) b + b + 8b

2. Collect like terms:

(a) t + s + t (b) 2p + 3n + 5p (c) 7k + 8k

(d) 20a + a+10c (e) n + s + n + s (f) 15p + 2t + p + 17t

Collection and Subtraction of like terms

1. (a) 4p-2p = (b) 6d - d= (c) 10b - 9b = (d) 3x - x =

Simplify

1. 3a + 4a = 7a
2. 8b - 2b = 6b
3. 2c-3c- 4c + 7c

collect the numbers to be added;

and the numbers to be subtracted

2c + 7c - 3c - 4c

Find the total of each and subtract.

9c-7c =2c

Work out the following:

1. 2a + 5a
2. 8a + 3a + 6a
3. 14x - 12x
4. 17c - 5c + 2c - 4c

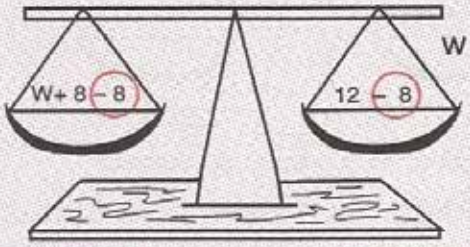
SOLVING EQUATIONS

Kaaria had w kg of sugar. He bought another 8 kg. If altogether he had 12 kg, what weight did w represent?

(i)

$w + 8 = 12$

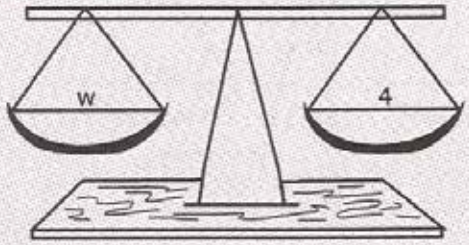
(ii)



$w + 8 - 8 = 12 - 8$

take away 8 take away 8

(iii)



$w = 4$

w = 4

In each of the three cases, the left hand side balances or is equal to the right hand side.

Thus:
$$w + 8 = 12$$
$$w + 8 - 8 = 12 - 8$$
$$w = 4$$

1. Find the unknown in the following:

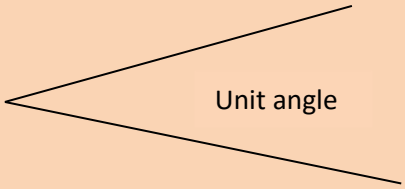
(a) w + 4 =15 (b) v + 6 = 20 (c) b + 5 = 18 (d) a + 9 = 22

(e) 19 + p = 30 (f) 12 + k = 31 (g) x + 12 = 12 (h) y + 6 = 7

(i) e + 1 = 99 (j) q + 18 = 19 (k) t + 75 = 100 (l) 70 + m = 80

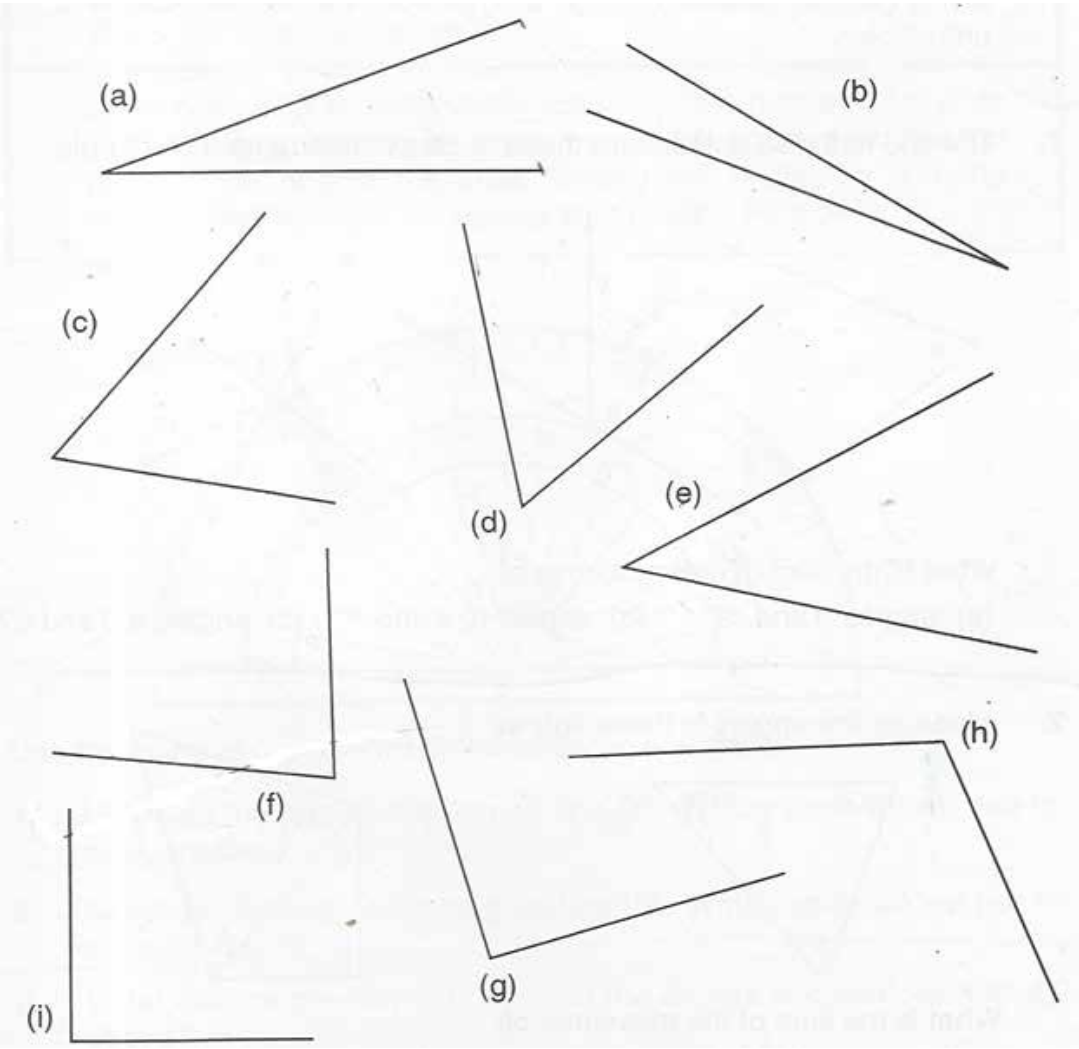
UNIT 9: GEOMETRY

Measuring angles

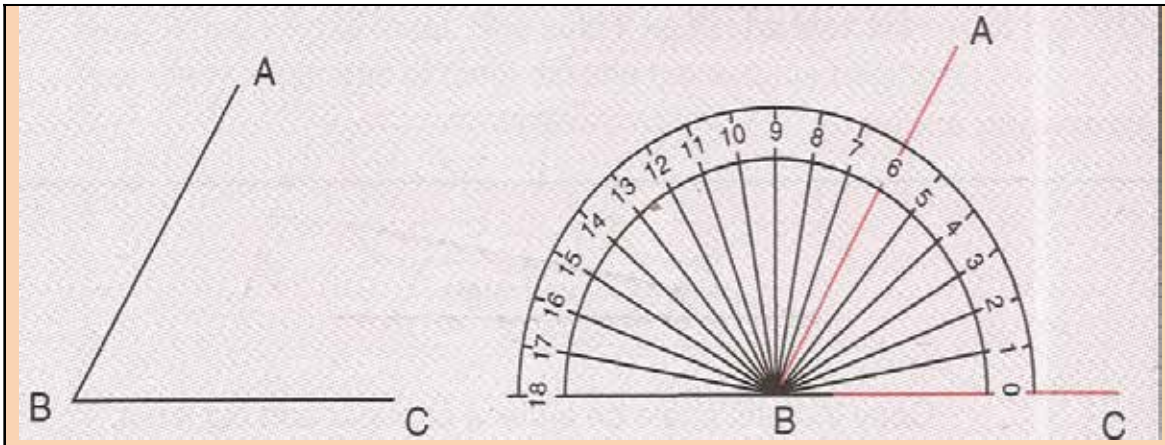


Copy the unit angle on a piece of paper and cut it out.

Use the unit angle to measure the following angles to the nearest unit:

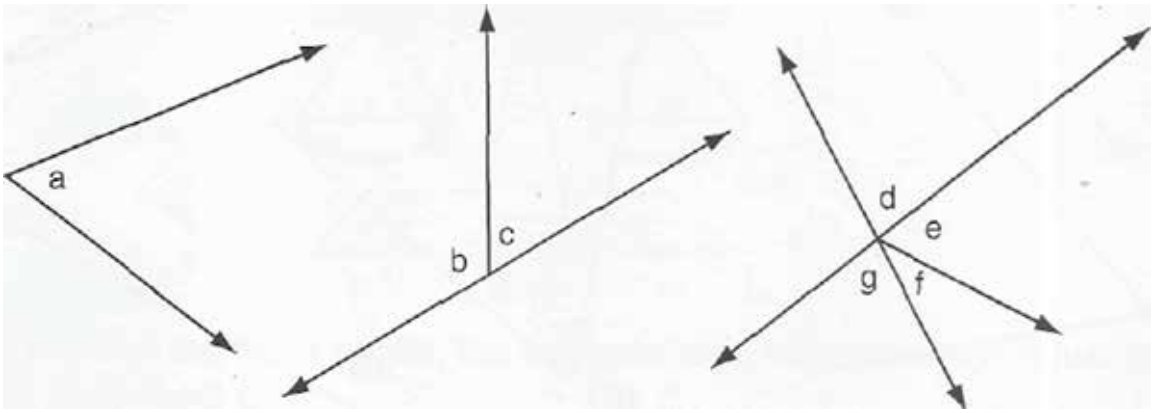


Measuring angles



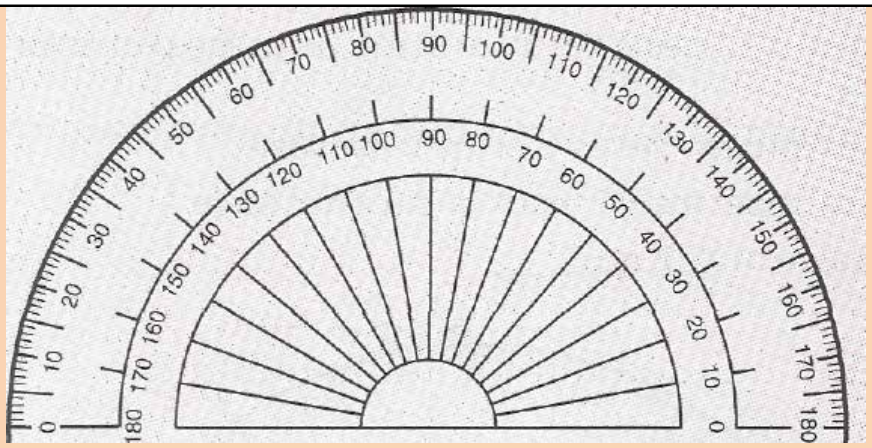
To find the size of ABC using the half disc, place the centre of the half, disc on the vertex B. Put the straight edge of the half disc along B&. AB passes through 6. Therefore the size of ABC is 6 unit angles.

Use the half disc to measure these angles to the nearest unit angle.



What is the sum of the measures of:

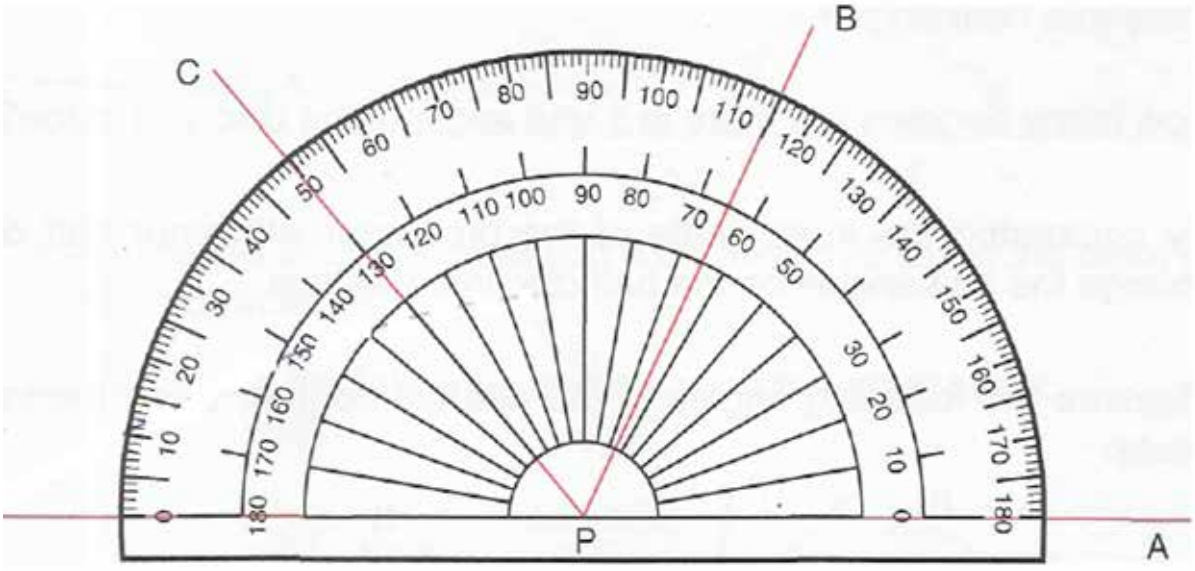
(a) angles b and c? (b) angles d, e and f? (c) angles e, f and g?



To measure angles more accurately we use a standard unit called a degree.

The symbol for one degree is 1°

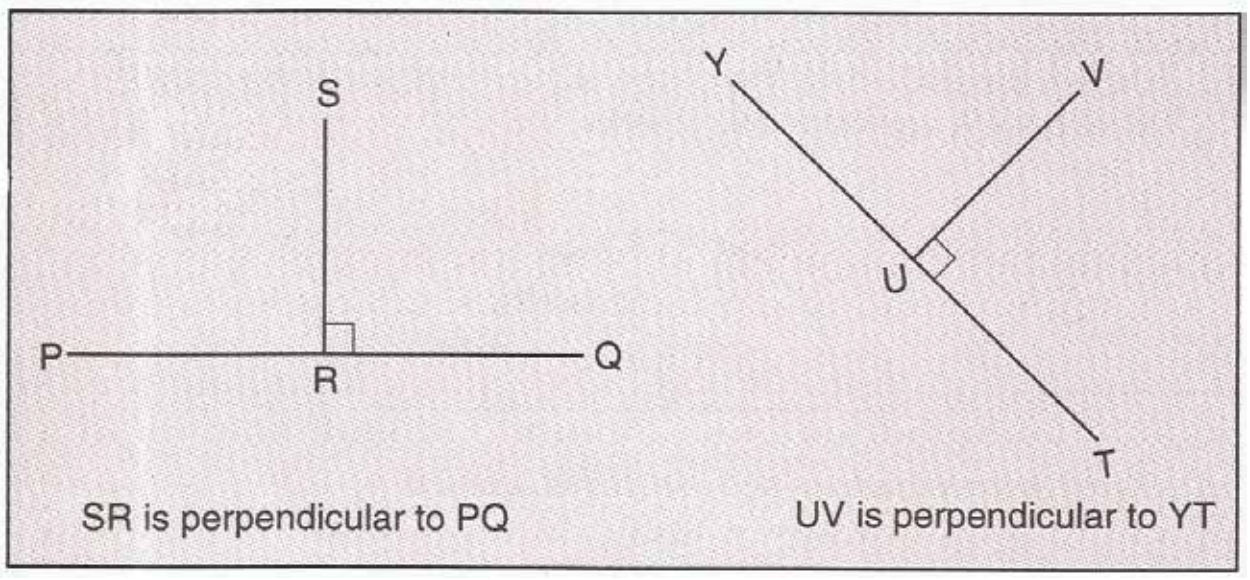
A ***Protractor*** is used for measuring angles in degrees. It has an ***inner*** scale and an ***outer*** scale. Each scale is marked from 0° to 180°. When measuring an angle, we use the scale which has the point 0° on one of the lines forming the angle. To find the measure of the angle, we always start reading from 0°



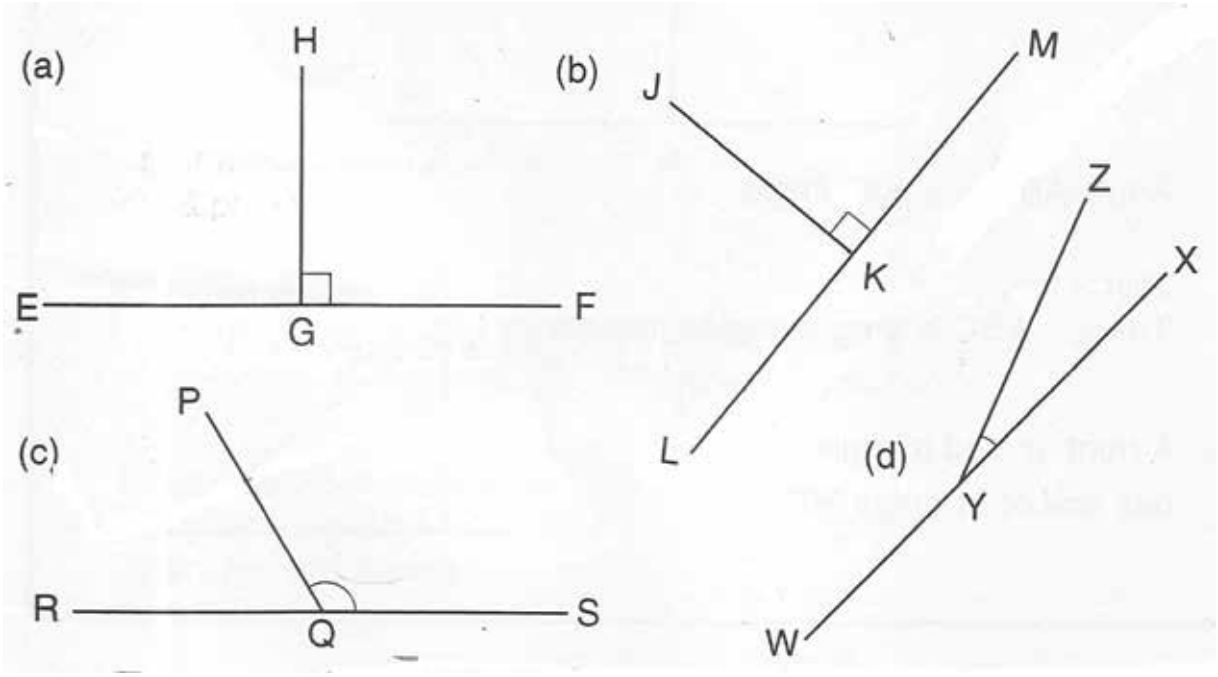
Use the figure above to answer the following questions:

1. Name all the angles starting on line DP. Which scale do we use to measure these angles?
2. Name all the angles starting on line PA. Which scale do we use to measure them?

Perpendicular lines

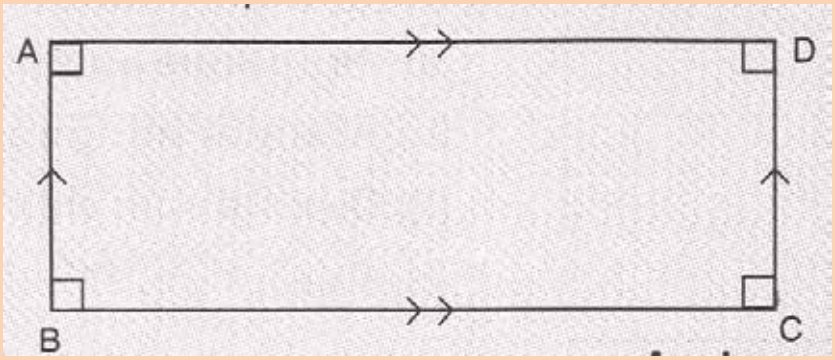


Measure the angles shown and name the lines that are perpendicular



RECTANGLE

Measure the sides and angles of this rectangle and fill in the blank spaces.



Sides Angles

AB = _____cm CD = _____cm ABC = _____ BCD = _____

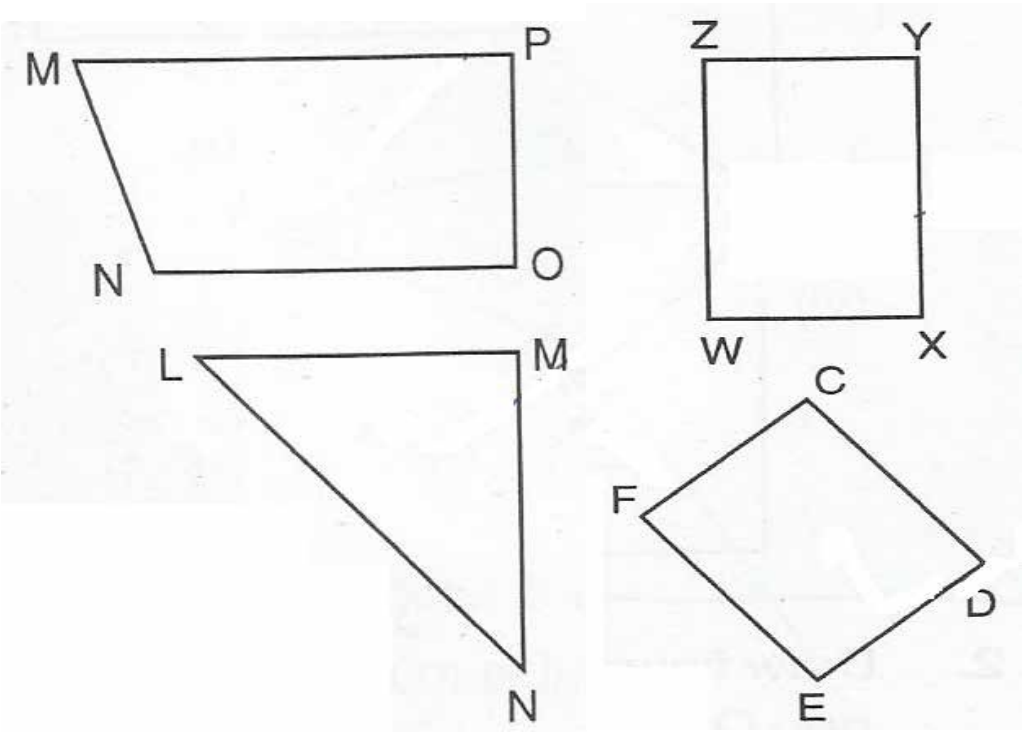
BC = _____cm DA = _____cm CDA = _____ DAB = _____

For a rectangle:

(a) Two opposite sides are equal. (b) All angles are right angles (90°)

(c) Opposite sides are parallel.

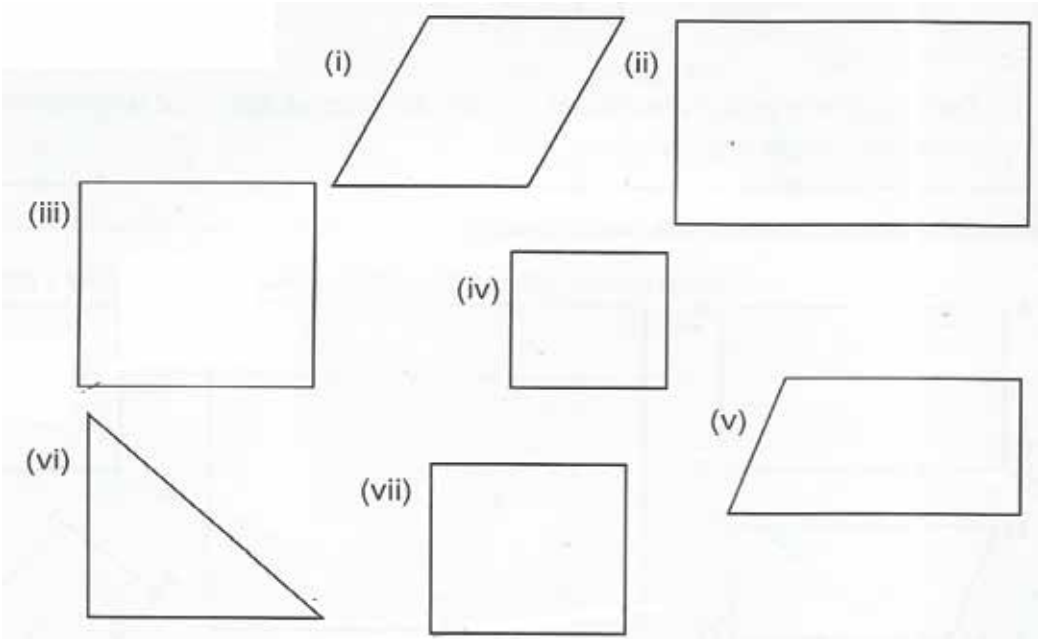
Which of these figures are rectangles?



1. Which of these diagrams are:

a) Squares?

b) Rectangles?



UNIT 10: MASS

Revision

1. How many $^{1}/_{2}$ kg packets are there in 5 kg?
2. How many half kilograms are there in 35 kg?
3. Gatdet weighs 71 kg and Walla weighs 65.2 kg. What is the difference in their mass?
4. A bag full of sugar weighs 100 kg. How many packets of sugar weighing 2 kg each can be made from the bag?
5. A boy packed sugar in 1 kg packets. How many packets did he make from 2 kg of sugar?
6. Mrs. Mading weighs 72 kg. Her sister weighs 1.95 kg more. What is her sister's mass?

(a)	We use kilograms to weigh heavy objects, e.g. a tin of maize.
(b)	We use grams to weigh light objects, e.g. small amounts of salt,
	1 kg = 1000 g
	$^{1}/_{2}$ kg = 500 g
	$^{1}/_{4}$ kg = 250 g

1. What is more suitable to use, kilogram or gram, when weighing the following?

(a) A tin of cooking oil;

(b) A sack full of sugar;

(c) A pencil;

(d) A packet of maize floor;

(e) Your teacher's weight?

Example 1

Change 3 500 grams into kilograms.

1 000 g = 1 kg

$3500\ g \quad \frac{3500}{1000} k\ g$

$= \frac{35}{10} k\ g$

$= 3.5\ k\ go\ r 3\frac{1}{2} k\ g$

Example 2

Change $2\frac{3}{4}$ kg into grams.

1 kg = 1000 g

2 kg = (1 000 x 2) g

= 2 000 g

$\frac{3}{4}$kg = 750 g i.e.$(\frac{3}{4} \times 1000 = 750\ g$

$\therefore 2\frac{3}{4} k\ g \quad 2000 g \quad 750\ g$

$= 2750\ g$

Or Since 1 kg = 1 000 g

then $2\frac{3}{4}$ kg = $(2\frac{3}{4}$ x 1000)g

= $(\frac{11}{4} \times 1000)$g

= 2 750 g

1. Change the following into kilograms:

(a) 3 000 g (b) 6 000 g (c) 1 000 g (d) 750 g

(e) 500 g (f) 2000g

2. Change the following into grams:

(a) ½ kg (b) 2 kg (c)12kg

(d) $^3/_4$ kg (e) 7 kg (f) 19kg

Example 3

Legu bought 24 tins of cooking fat. Each tin contained 500 g of the fat. How many kilograms of fat did he buy?

1 tin weighs 500 g

24 tins weigh (24 X 500) g

(24X500) g = 12 000 g

1 000 g = 1 kg

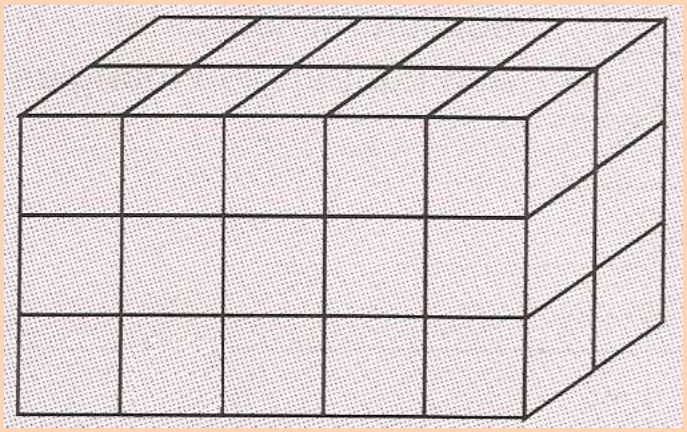
$\therefore 12\ 000\ g \quad \frac{12000}{1000} k\ g$

= 12 kg

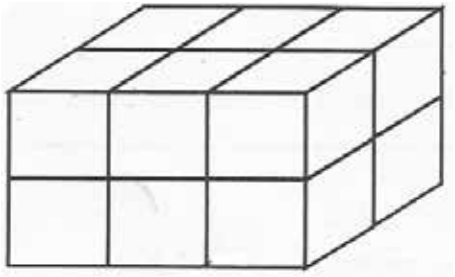
. There are 200 packets of tea leaves in a carton. Each packet weighs 250 g. What is the total mass of tea leaves in the carton? (Answer in kg.)

UNIT 11: VOLUME AND CAPACITY

VOLUME

	This is a stack of cubes. How many cubes are in the stack? Each layer has 5 columns and 2 rows. There are 3 such layers. We describe the stack as 5 by 2 by 3 Number of cubes in the stack =5 x 2 x 3 = 30 cubes

1.

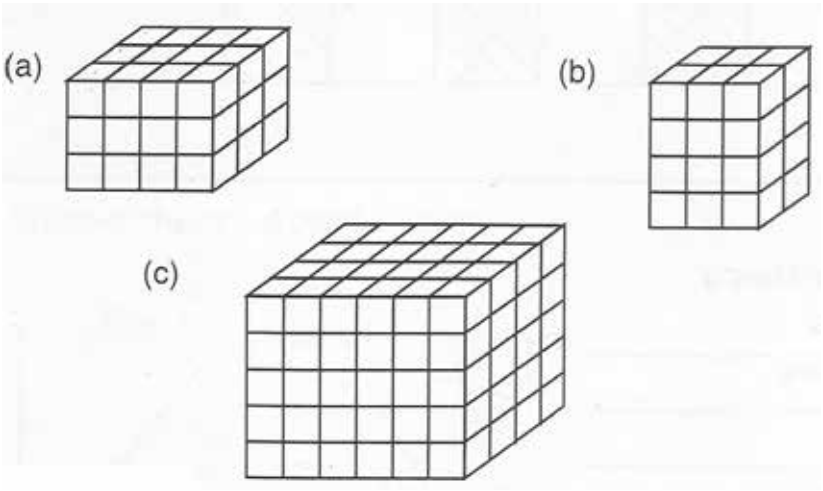


(a) How many layers are there in this stack?

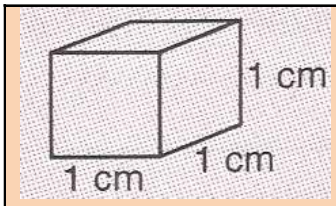
(b) How many cubes are there in each layer?

(c) How many cubes are there altogether in the stack?

2. How many cubes are arranged to form each of the following stacks?



1. Madding arranged bricks in three layers. Each layer had three columns and four rows. How many bricks did he arrange altogether?



This is a centimetre cube.

It measures 1 cm by 1 cm by 1 cm.

Its volume is 1 cubic centimetre ($1cm^3$).

Volume is a measure of the space occupied by an object.

We can find the volume of a cuboid by finding the number of cubes needed to make it.

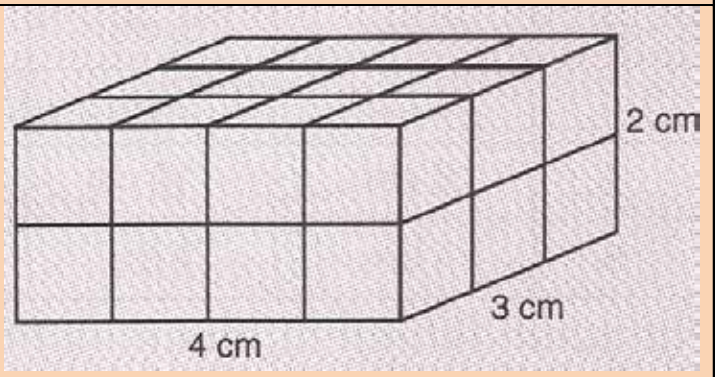
Example:

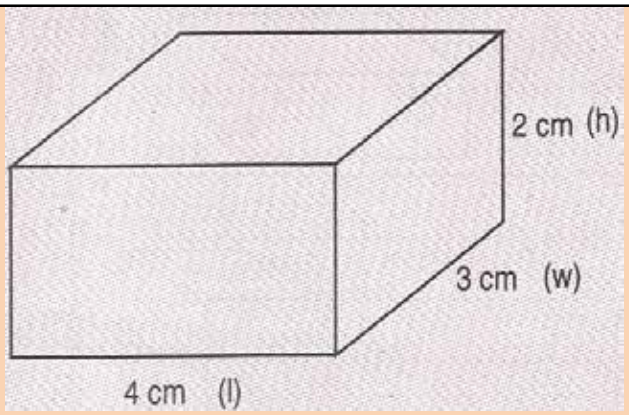
The stack shown here is made from centimetre cubes. It has 2 layers. In every layer there are 3 rows, each with 4 cubes.

The number of cubes in a layer is 4 x 3 = 12

The number of cubes in the stack is 12 x 2=24

The volume of the stack is 24 cm^3.





Volume = length x width x height

or V = *l* x *w* x *h*

Length = 4 cm

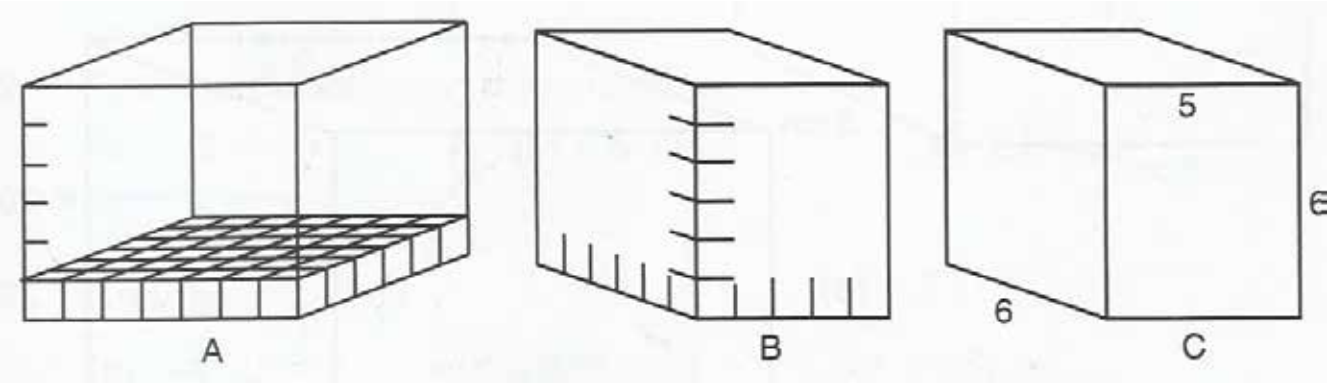
width = 3 cm

height =2 cm

Volume = (4x3x2) cm^3

= 24 cm^3

These blocks can be made up of centimetre cubes. Study them and answer the questions below:



(a) How many layers will be needed to make each of the blocks A, B and C?

(b) How many rows will be needed to make each layer?

(c) How many columns will be needed to make each layer?

(d) How many cubes will be needed to make each block?

CAPACITY

1 Litre = 1 000 millilitres (ml)
$\frac{1}{2}$ Litre = 500 millilitres (ml)
$\frac{1}{4}$ Litre = 250 millilitres (ml)

Estimating and measuring in ml.

1. Record estimates and actual measurements of selected containers in the table below:

Containers	Estimated Measurements in	Actual Measurements in ml.
1. Soda bottle		
2. Ink bottle		
3.		
4.		
5.		
6.		

2. Change the following into milliliters:

(a) 3 litres (b) 4.5 litres (c) $2^{2}/_{8}$ litres

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