P. 6 MATHEMATICS LESSON NOTES

TERM 3

Lesson 1, 2 and 3 week one

MEASUREMENT: LENGTH, MASS AND CAPACITY.

LENGTH

Revision: Changing km to cm

Changing Metres to Kilometres

Changing metres to cm

Changing cm to metres

Changing millimeters to cm

CHANGING SQUARE METRES TO SQUARE CENTIMETRES

1M = 100Cm

$1M^2$ = 100cm x 100cm

$1M^2 = 10{,}000cm^2$

Change $2m^2$ to cm^2

$1M^2 = 10{,}000cm^2$

$2m^2 = 2 \times 10{,}000cm^2$

$= 20{,}000cm^2$

Express $1.2m^2$ as cm^2

$1M^2 = 10{,}000cm^2$

$1.2m^2 = \frac{12}{10} \times 10{,}000cm^2$

$= \underline{12000cm^2}$

CHANGING SQUARE CENTIMETRES TO SQUARE METRES

Change $9000cm^3$ to m^2

$10{,}000cm^2 = 1M^2$

$1cm^2 = \frac{1}{10{,}000} m2$

$9000cm^2 = \frac{1}{10{,}000} \times 9000m^2$

$\frac{9}{10}$

$= \underline{0.9m^2}$

Convert $120000cm^2$ to m^2

$10{,}000cm^2 = 1M^2$

$1cm^2 = \frac{1}{10,000} m2$

$120,000cm^2 = \frac{1}{10,000} \times 120,000$

$= 12m^2$

EXPRESSING SQUARE KILOMETRES (KM^2) AS SQUARE METRES (M^2)

$1KM = 1000M$

$1KM^2 = 1000M \times 1000M$

$1KM^2 = 1,000,000M^2$

Express $4Km^2$ as M^2

$1KM^2 = 1,000,000M^2$

$4Km^2 = 4 \times 1000000$

$= 4,000,000m^2$

Change $2.5km^2$ to m^2

$1KM^2 = 10,000,000m^2$

$2.5km^2 = \frac{25}{10} \times 1,000,000$

$2,500,000m^2$

EXPRESSING SQUARE METRES (M^2) TO SQUARE KILOMETRES (KM^2)

express $140000m^2$ to km^2

$1,000,000m^2 = 1km^2$

$140,000m^2 = \frac{140,000}{1000,000}$

$= 0.14m^2$

Mk Primary MTC bk 6 pg 317

Lesson 4 and 5 week one.

AREA AND PERIMETER

Revision: Area of square and rectangle

E.g The area of a rectangle is $56m^2$. The length is 8m. Find the perimeter.

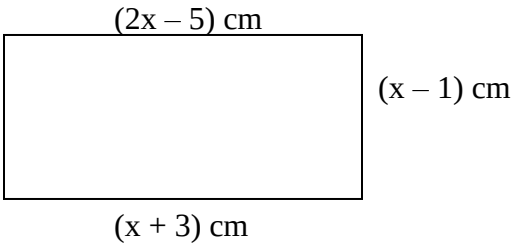
2. The area of a square is $49dm^2$. Find its perimeter.

3. The perimeter of a rectangle is 40cm and its width is 8cm. Find its area.

4. The perimeter of a square is 24cm. Find its area.

Lesson 6 and 1 week one

FINDING SIDES, AREA AND PERIMETER



Find the value of x.

Opposite sides of rectangles are equal.

(2x-5) cm = (x+3) cm

$$\frac{(2x-5)cm}{cm} = \frac{(x-3)cm}{cm}$$

2x-5 = x+3

2x-5+5 = x+3+5

2x=x+8

2x-x=x-x+8

x= 8

Find the length. Width

(x + 3) cm (x – 1) cm

(8+3) cm (8-1) cm

11cm 7cm

Find its area

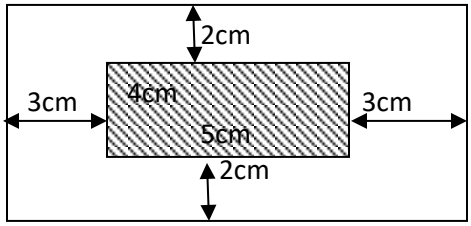
A = L x W

11cm x 7cm

A = 77cm²

Lesson 2 and 3 week two.

SUBTRACTION OF AREA



Find the length and width of the outer rectangle.

Length Width

= 3cm + 5cm + 3cm 4cm + 2cm + 2cm

11cm 8cm

b) Calculate the area of the unshaded part.

Area of the outer rectangle Area of inner rectangle

A = L x W A = L x W

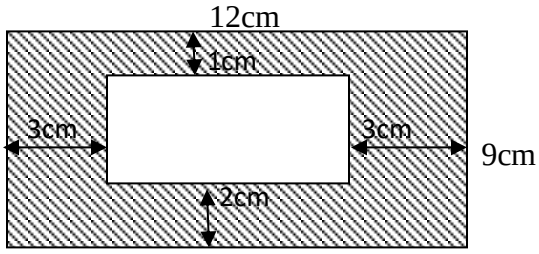
11cm x 8cm 5cm x 4cm

$88cm^2$ $20cm^2$

Area of the unshaded part = Area of the outer rectangle – Area of the inner rectangle

$88cm^2 - 20cm^2$

$68cm^2$



Find the length and width of the inner rectangle.

Length

12cm – 3cm – 2cm

7cm

or

12cm – (3 + 2)cm

12cm – 5cm = 7cm

6cm

Find the area of the shaded part.

Area of outer rectangle

A = L x W

12cm x 9cm

108cm

Area of outer rectangle

A = L x W

6cm x 6cm

36cm

Area of under part

$108cm^2$

$-36cm^2$

$72cm^2$

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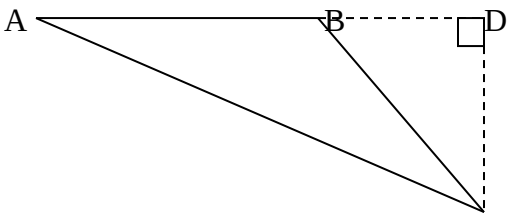
Lesson 4 and 5 week two

AREA OF A TRIANGLE

Area = $\frac{1}{2}$ x base x height



C

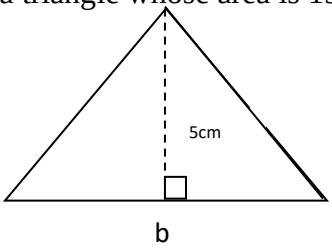
BD = 4cm $\overline{AB}$= 9cm DC = 6cm

Find the area of triangle ABC

AB = 9cm – 4cm = 5cm

A = 15 cm^2.

Find the base of a triangle whose area is 15cm^2 and height 5cm.



$A = \frac{1}{2}bh$

$\frac{1}{2}$ x b x 5cm= 15cm^2

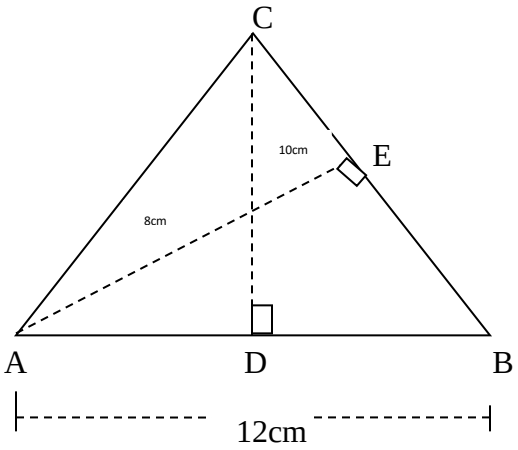
2 x $\frac{5}{2}$ = 15cm^2 x 2

$\frac{5}{5} = \frac{30cm}{5}$

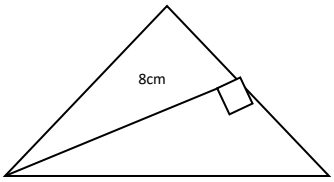
b = 6cm

FINDING THE BASE OR HEIGHT BY COMPARING AREA

Note: Different heights of the same triangle do not change the area of the triangle.



Find the length CB



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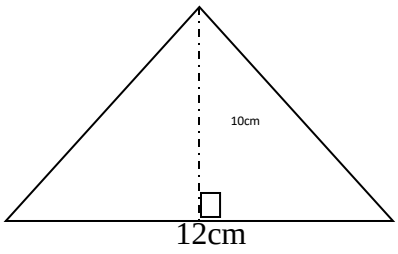


$A = \frac{1}{2}bh$

$\frac{1}{2} \times b\text{cm} \times 8\text{cm} = \frac{1}{2} \times 12\text{cm} \times 10\text{cm}$

$4b\text{cm} = 60\text{cm}^2$

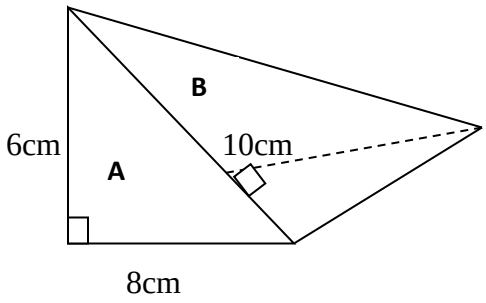
$\frac{4cm}{4cm} = \frac{60cmxcm}{4cm}$

$B = 15\text{cm}$

= 15cm

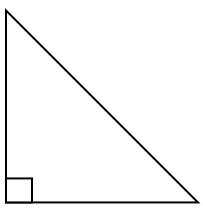
MK Primary MTC bk 6 pg 341.

FINDING THE AREA OF COMBINED SHAPES



Find the area of the figure

Area = Area of A + Area of B



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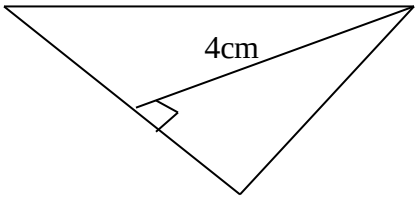


6cm 10cm

8cm

$A = \frac{1}{2}bh + \frac{1}{2}bh$

$\frac{1}{2} \times 8cm \times 6cm + \frac{1}{2} \times 10cm \times 4cm$

$24cm^2 + 20cm^2$

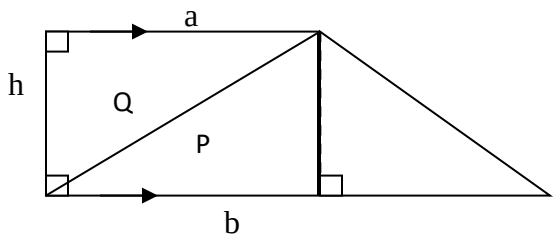
$A = 44cm^2$

MK Primary MTC bk 6 pg 343

Lesson 6 and 1 week two and three respectively.

AREA OF A TRAPEZIUM

A trapezium is a quadrilateral with one opposite side parallel. (Two sides are parallel)



Area of a trapezium = Area of triangle Q + area of triangle P.

Area of triangle Q = $\frac{1}{2}bh$ + Area of triangle P

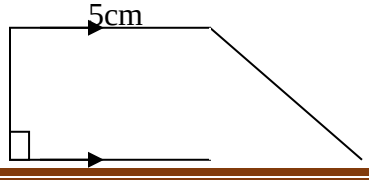
$\frac{1}{2}ah = \frac{1}{2}bh$

Area of a trapezium = $\frac{1}{2}ah + \frac{1}{2}bh$

Area of a trapezium = $\frac{1}{2}h(a + b)$

Where a and b are the parallel lines.

Example: Find the area of the figure



6cm

10cm

$A = \frac{1}{2} h(a + b)$

$\frac{1}{2}$ x 6cm (10cm + 5cm)

$\frac{1}{2}$ x 6cm x 15cm

$45cm^2$

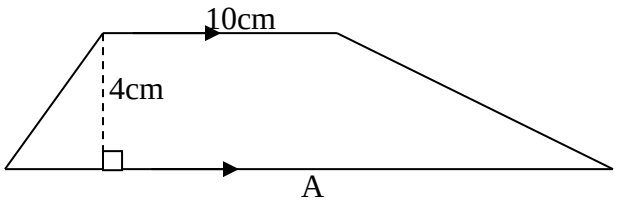
MK Primary MTC bk 6 pg 344.

Revision MTC for upper primary.

FINDING ONE SIDE OF A TRAPEZIUM

The area of a trapezium is $60cm^2$, the height is 4cm and one of the parallel sides is 10cm.

Find the length of the second parallel line.



$A = \frac{1}{2} h(a + b)$

$\frac{1}{2}$ x 4cm (a + 10cm) = $60cm^2$

2acm + 2cm x 10cm = $60cm^2$

$2acm^2 + 20cm^2 = 60cm^2$

$2acm^2 + 20cm^2 - 20cm^2 = 60cm^2 - 20cm^2$

$\frac{2acm}{2cm} = \frac{140cm2}{2cm}$

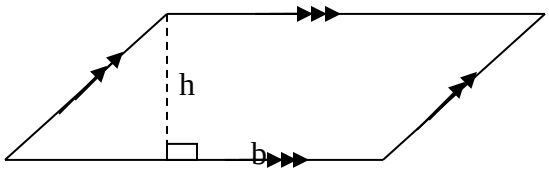
a = 20cm

MK Primary MTC bk 6 pg 346.

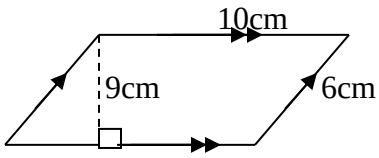
MK Primary MTC bk 7.

Lesson two and three week three.

AREA OF PARALLELOGRAM



Area of a parallelogram = base x height

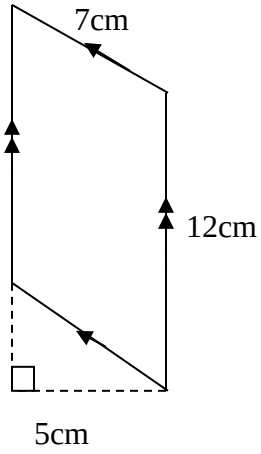


Find the area of the figure

A = b x h

10cm x 9cm

A= 90cm^2



Find the area of the figure.

A = b x h

12cm x 5cm

A = 60cm^2

MK Primary MTC bk 6 pg 347.

Revision Mathematics for upper Primary pg 79.

AREA OF A RHOMBUS

A rhombus is a quadrilateral with all sides equal, two opposite sides are parallel and two opposite angles are equal.

Area of a rhombus= ½ x d1 xd2

Example

1. Calculate the area of a rhombus whose diagonals are 12cm and 16cm.

Area= ½ x d1x d2

=1/2 x 12cm x 16cm

= 6cm x 16cm

= 96cm²

2. Study the rhombus below and use to answer the questions that follow

a) Calculate the area.

Area = ½ x d1 xd2

= ½ x 18dm x 20dm

= 180dm²

Lesson four week three.

AREA OF A KITE

A kite is a quadrilateral made up of two isosceles triangles joined together.

Area = ½ x d1 x d2

Example

1. Work out the area of a kite whose diagonals are 9cm and 14cm.

Area = ½ x d1 x d2

= ½ x 9cm x 14cm

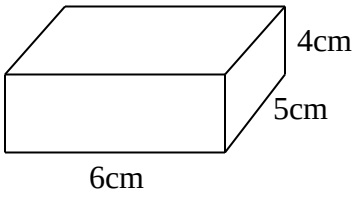
= 9cm x 7cm

= 63 cm²

Mk book 7 page , Fountain primary Mtcs Bk 7 page

Lesson 5 and 6 week three

TOTAL SURFACE AREA OF CUBOID AND CUBE



Find the total surface area.

TSA = 2 (L x W) + 2 (L x h) + 2 (L x W)

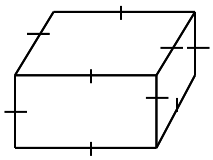
2(6cm x 5cm) + 2(6cm x 4cm) + 2(5cm x 4cm)

2 x $30cm^2$ + 2 x $24cm^2$ + 2 x $20cm^2$

$60cm^2$ + $48cm^2$ + $40cm^2$

$148cm^2$

Find the total surface area of cube whose sides is 4cm.



A cube has all its face equal.

Each face is a square

Area of one face = s x s

S^2

Area of the 6 faces = 6 x S^2

T.S.A of a cube = S^2

Find the total surface area of a cube whose sides is 4cm.

T.S.A = $6S^2$

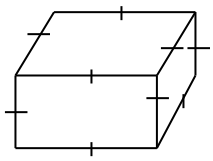
6 x 4cm x 4cm

6 x $16cm^2$

$96cm^2$

FINDING THE SIDES OF A CUBE WHEN GIVEN THE TOTAL SURFACE AREA

The total surface area of a cube is $384cm^2$. Find the length of each side of a square.



T.S.A = $6S^2$

$6 = 348cm^2$

$$\frac{6s}{6} = \frac{384cm}{6}$$

$$\sqrt{S2} = \sqrt{64cm}$$

S = 8cm

MK Primary MTC bk 6 pg 351

Lesson 1 and 2 week four.

VOLUME

Volume is the amount of space occupied by an object.

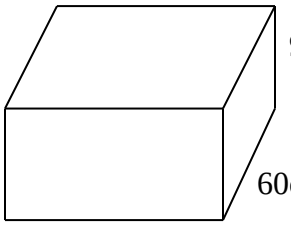
Volume is measured in cubic metric unit.

Revision: Volume of a cuboid and cube

FINDING VOLUME IN LITRES

A rectangular tank is 30cm by 60cm by 90cm.

Find its volume in litres.



V= L x w x h

30cm x 60cm x 90cm

1800cm+2 x 90cm

$162000cm^3$

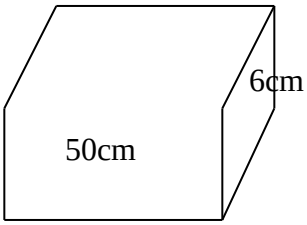
1 litre -= $1000cm^3$

$162000cm^3 = \frac{162000}{1000}$

= 162 litres

The volume of a rectangle prism is 12 litres. Find its height.

h



V = L x w x h

5cm x 6cm x h = 12 litres

but 1 litre = $1000cm^3$

12 litres = 12 x $1000cm^3$

$12000cm^3$

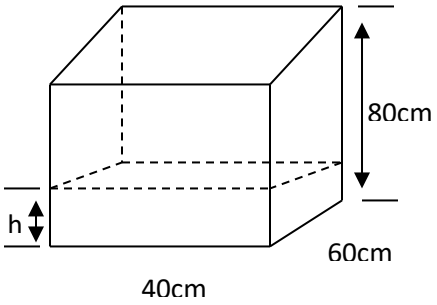
50cm x 6cm x h = $12000cm^3$

$3000cm^2$ x h = 12000cm x cm x cm

$\frac{3000xcmxh}{3000cmxcm} = \frac{12000cmxcmxcm}{3000cmxcm}$ h =4cm

MORE ABOUT VOLUME

The tank is holding 72litres of water.



i) Calculate value of h.

1litre = $1000cm^3$

72litres = 72 x $1000cm^3$

$72000cm^3$

L x W x h = V

40cm x 60cm x h = $72000cm^3$

$$\frac{40cmx60cmxh}{40cmx60cm} = \frac{72000cmxcmxcm}{40cmx60cm}$$

h = 30cm

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

The height of water needed to fill the tank

80cm – 30cm = 50cm

Volume of the water needed = 40cm x 60cm x 50cm

$2400cm^2$ x 50cm

$120000cm^3$

$1000cm^3$ = 1litre

$$120000cm^3 = \frac{120000cm}{1000}$$

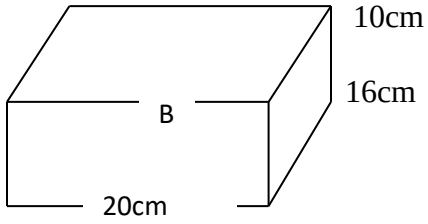
= 120litres

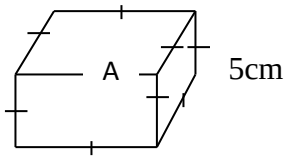
MK Primary MTC bk 6 pg 359

Lesson 3 and 4 week four.

PACKING CUBES AND CUBOIDS

How many cubes of type A can be packed in box B?





No. of cubes along the length = $\frac{lengthofB}{lengthofA}$

$= \frac{20cm}{5cm}$

4 cubes

No of cubes along the width = $\frac{widthofB}{WidthofA}$

$\frac{16cm}{5cm}$

3 cubes

No of cubes along the height = $\frac{heightB}{heightofA}$

$\frac{10cm}{5cm}$

2 cubes

No of cubes = 4 cubes x 3cubes x 2

24cubes

b) How many cubes will be packed on the 1st layer?

No of cubes along the length x No of cubes along the width.

5cubes x 3cubes 4cubes x 3 cubes

20 cubes = 12cubes

c) How many layers will be there?

No of layers = $\frac{\text{Height of B}}{\text{Height of A}}$

$\frac{10cm}{5cm}$

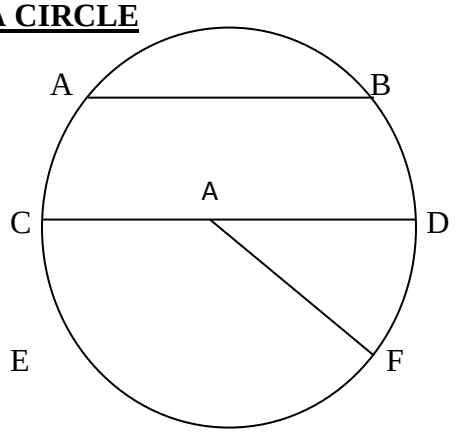
= 2 layers

Lesson 5 and 6 week four

CIRCUMFERENCE

CIRCLE

PARTS OF A CIRCLE



AB = Chord

CD = Diameter

CA = Radius

AD = Radius

AF = Radius

AE = Radius

EAF = Sector

Diameter is the longest distance.

Circumference is the distance round a circular object.

Diameter is a line that passes through the centre and touches on the circumference.

Radius is any line drawn from the centre to the circumference.

Radius is half a diameter.

Radius = Diameter ÷ 2

Diameter = 2 x radius or radius t radius

FINDING THE RADIUS WHEN GIVEN THE DIAMETER

The diameter of a circle is 14cm. find its radius.

$$\text{Radius} = \frac{Diameter}{2}$$

$$= \frac{14cm}{2}$$

$$R = 7cm$$

The diameter of a circle is 17cm. find its radius.

$$\text{Radius} = \frac{Diameter}{2}$$

$$= \frac{17cm}{2}$$

$$= 8\frac{1}{2} \text{ or } 8.5cm$$

FINDING THE DIAMETER OF A CIRCLE WHEN GIVEN RADIUS

The radius of a circle is 14cm. find its diameter.

Diameter = radius x 2

14cm x 2

28cm.

Find the diameter of a circle whose radius is 3.7dm.

Diameter = 2 x radius

3 x 3.7dm

7.4dm

CIRCUMFERENCE OF A CIRCLE

Note: $\frac{Circumference}{Diameter} = P_i$

Circumference = π x diameter

πd or 2πr

$\pi = \frac{22}{7}$ or 3.14 or $3\frac{1}{7}$

Find the circumference of a circle whose diameter is 14cm.

C = πd

$\frac{22}{7}$ x 14cm

22 x 2cm

C = 44cm

Find the circumference of a circle whose radius is 14cm.

C = πd or 2πr

$$2 \text{ x } \frac{22}{7} \text{ x } 14\text{cm}$$

$$C = 88\text{cm}$$

Find the circumference of a circle whose radius is 20cm.

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Functional Primary MTC for Uganda bk 6 pg 268.

Lesson 1 and 2 week five

AREA OF A CIRCLE

Proving that area of a circle =

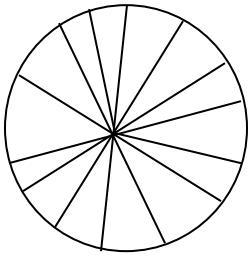
Procedure

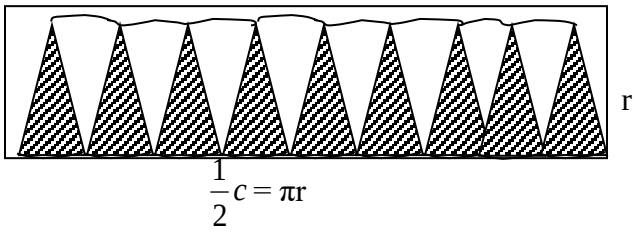
i) Get a rectangle piece of paper.

ii) Fold it in halves.

iii) Then in quarters.

iv) Keep O the centre and fold the shorter lining on to the longer living three times and each time cutting off the parts that are not covered. Unfold the paper. You will get a circle. Them arrange them in form of rectangle.





Area of a rectangle = L x W

Area of a circle = $\frac{1}{2}c$ x r

$$= \frac{1}{2} \text{ x } 2\ \pi r \text{ x } r$$

$$= \pi r \text{ x } r$$

$= \pi r^2$

Area = πr^2

Find the area of a circle whose radius is 7cm.

A = πr^2

$\frac{22}{7}$ x 7cm x 7cm

22 x $7cm^2$

$154cm^2$

Find the area of a circle where radius is 5cm.

Area = πr^2

3.14 x 5cm x 5cm	314
3.14 x 25	x25
78.50	1570
$78.50cm^2$	x 28 =7850

Lesson 3, 4 and 5 week 5

INTEGERS

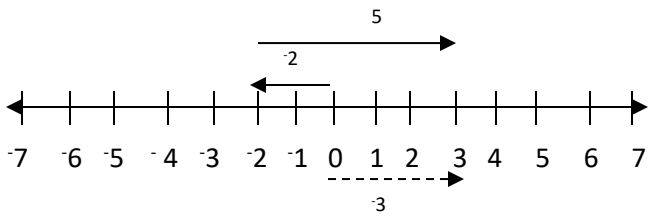
Integers are made up of negative, positive numbers and zero.

Revision: Arrows on the numbers

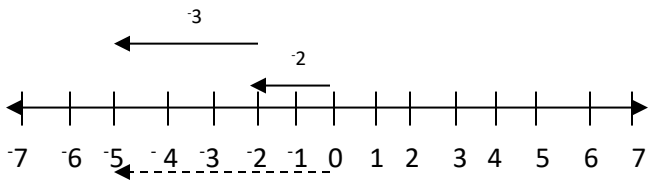
Ordering integers

ADDITION OF INTEGERS ON NUMBERLINE

Add -2 + 5



$^{-}2 + {}^{-}3$



ADDING INTEGERS WITHOUT A NUMBERLINE

5 + $^{-}3$

Pos.	Neg
+	-
+	-
+	-
+	
+	

5 + $^{-}3 = 2$

$^{-}6 + 4$

Neg	Pos.
-	+
-	+
-	+
-	
-	

$^{-}6 + 4 = {}^{-}2$

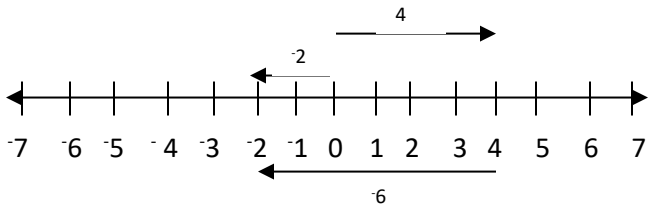
MK Primary MTC bk 6.

Understanding MTC bk 6 pg 164.

Functional Primary MTC bk 6 pg 167

SUBTRACTION OF INTEGERS

$^{-}2 - 4$

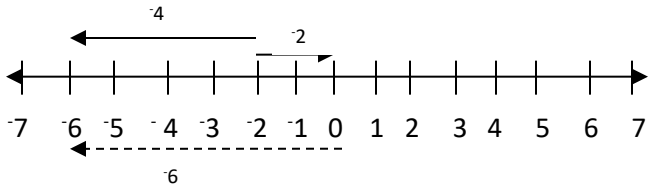


$^{-}2 - 4 = {}^{-}6$

Or

$^{-}2 - 4$

$^{-}2 + {}^{-}4$



$^{-}2 + {}^{-}4 = {}^{-}6$

SUBTRACTION OF INTEGERS WITHOUT A NUMBERLINE

Subtract inter is the same as adding the opposite of the second integer to the first.

$7 - {}^{-}5 = 7 + {}^{+}5$

$= 12$

$^{-}9 - 2 = {}^{-}9 + {}^{-}2$

$= 11$

$2 - 3 = 2 + {}^{-}3$

$= {}^{-}11$

$^{-}6 - {}^{-}4 = {}^{-}6 + 4$

$^{-}2$

MK Primary MTC bk 6 pg 201

Understanding MTC bk 6 pg 168

Functional Primary MTC bk 6 pg 170.

Lesson 6 week 5 and lesson 1 week 6

MULTIPLICATION OF INTEGERS

Positive x Positive = Positive

Positive x Negative = Negative

Negative x Negative = Positive

$6 \times {}^{+}2 = {}^{+}12$

$^{-}4 \times {}^{-}2 = {}^{+}8$

$7 \times {}^{-}5 = {}^{-}35$

DIVISION OF INTEGERS

Positive ÷ Positive = Positive

Negative ÷ Positive = Negative

Positive ÷ Negative = Negative

Negative ÷ Negative = Negative

$16 \div 4 = 4$ $\quad {}^{-}12 \div 3 = {}^{-}4$ $\quad 12 \div {}^{-}3 = {}^{-}4$ $\quad {}^{-}12 \div {}^{-}3 = 4$

Lesson 2 and 3 week 6

APPLICATION OF INTEGERS.

Examples

1. The temperature of a place was 36º C but fell by 12ºC. What was the new temperature of the place?

Solution: new temperature = 36ºC - 12ºC

= 24ºC

2. A taxi leaves town A with 14 passengers town B, at B 9 passengers get out and 6 other passengers board and the taxi continues to town C. How many passengers reach town C?

   Solution: 14 – 9 +6

   = 5+6

   = 11passengers.

   Lesson 4, 5 and 6 week 6

APPLICATION OF FINITE SYSTEMS.

EXAMPLES

1. If today is Tuesday what day of the week will be it after 38 days?

   Solution: S M T W T F S

   0 1 2 3 4 5 6

   Day + no of days = ….. (finite7)

   2 + 38 = ….. (Finite7)

   40 ÷ 7 = 5 remainder 5

   The remainder is 5 so the day will be Friday.

2. If today is Wednesday what day of the week was 47 days ago?

   Solution: day - no of days =..... (Finite 7)

   3 - 47 =..... (Finite 7)

   47 ÷ 7 = 6 rem 5

   3- 5 =..... (Finite 7)

   (3+7) – 5 =..... (Finite 7)

10 – 5 = 5 (finite 7) the day was Friday 47 days ago.

3. It is September now, what month of the year will it be 38 months from now?

   Solution: month + no. of months =.... (Finite 12)

   9 + 38 =..... (Finite 12)

   47 ÷ 12 =3 rem 11

   The month of the year will be November