Let's pave the way for learning and
Move Forward

Standard - 8

Mathematics

Dear students,

The evaluation of the answer scripts of the First Terminal Examination 2022 and the classroom experiences shared by the teachers concerned, have brought to light the fact that our children have suffered some serious learning gap due to the non-availability of proper learning experiences as a result of the unprecedented situation created by the Covid Pandemic from 2019 to 2022. An activity book has been designed to assist children internalize the concepts which they ought to have mastered in the previous classes and with the intention to facilitate further learning. Necessary explanations and activities are included in the booklet to help children bridge the gap.It is hoped that this package will facilitate the learners for self-study or for studying with the help of their teachers and I wish them success in their endeavors to move forward with confidence.

Director
SCERT, Kerala
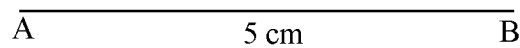
1. Equal Triangles

Activity 1

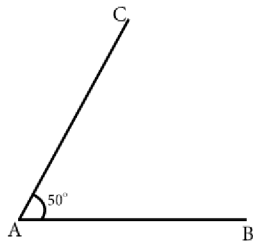a) Guess and write the measures of angles given below.

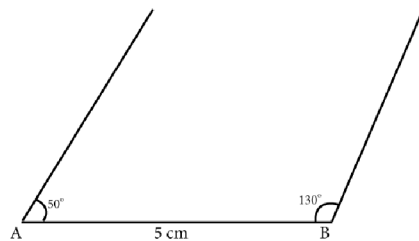b) Measure each angle and verify the guessing.

Activity 2

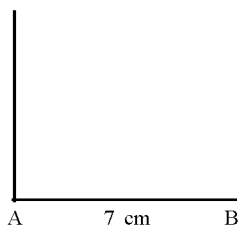In the figure, the line AB is drawn with 5cm length.

A   5 cm   B

a) Draw a line AB of length 5centimetres. Then draw an angle of measure 50° at A.

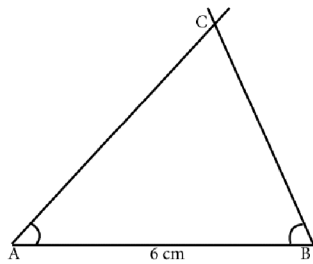b) Draw an angle of measure 130° at B.

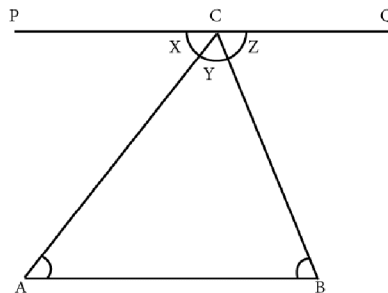c) Draw a line of length 7 centimetres. Then draw 90° angle at one end.

Activity 3

a)   Draw a line AB of length 6 cm ,then draw 50° angle at A and 70° angle at B.

b)   Write the name of the figure obtained.

c)   If we take the third vertex as C, write the measure of ∠C.

Activity 4

In the figure , PQ is drawn through C parallel to AB.

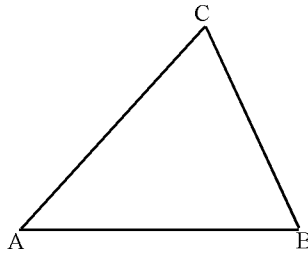

a)   x + y + z = _____

b)   ∠A = _____ (x, y, z)

c)   ∠B = _____ (x, y, z)

d)   ∠A + ∠B + ∠ACB = _____

- Any pair of alternate angles formed when two parallel lines intersect another line are equal.

- Sum of the angles of a triangle is 180°

Activity 5

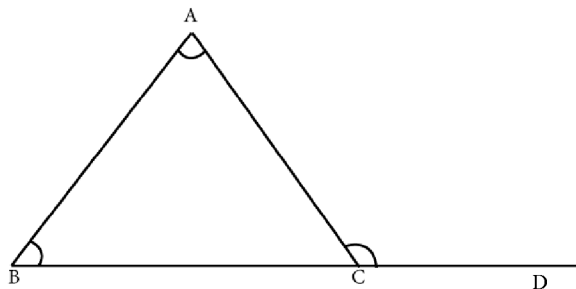a) Write the sides and angles of triangle ABC given below:

b) If $\angle A = 40°$ and $\angle B = 70°$ then, $\angle A + \angle B =$ _____

c) $\angle A + \angle B + \angle C =$ _____

d) What is the measure of $\angle C$?

Activity 6

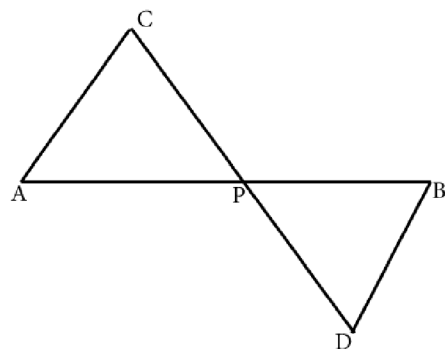In the figure, $\angle A = 60°$, $\angle B = 50°$ then,

a) $\angle ACB =$ _____

b) $\angle ACD =$ _____

c) $\angle A + \angle B =$ _____

Activity 7

In the figure, AC and BD are parallel. Then,

a) Write the pairs of equal angles of triangles APC and BPD.

b) If $\angle APC = 40°$ and $\angle A = 70°$ then, find the measures of $\angle C$, $\angle B$, $\angle BPD$ and $\angle D$?

* * * *

2. Equations

Activity 1

A number added to 7 gives 12. Find the number.

- The number + 7 = 12

  We know that, 5 + 7 = 12

  So, the number is 5

  To find the number we want to subtract 7 from 12.

  If number + 7 = 12,

  then number = 12 - 7 = 5

- 7 subtracted from a number gives 12. Find the number.

  number - 7 = 12

  number = 12 + 7 = 19

Activity 2

512 added to a number gives 728. Find the number.

Activity 3

211 subtracted from a number gives 120. Find the number.

Activity 4

If 17 more score is got, then score in Maths becomes 100. Find the actual score got.

Activity 5

2 times a number is 18. Find the number.

  number × 2 = 18

  we know that 9 × 2 = 18

  Therefore, number = 9

- 18 is twice the number. So the number is half of 18.

  number = 18 ÷ 2 = 9

Activity 6

Half of a number is 18. Find the number.

Here, half of a number is 18. So the number is double of 18.

number $= 18 \times 2 = 36$

Activity 7

*   3 times a number is 75. What is the number?

* $\frac{1}{3}$ of a number is 75. What is the number?

*   12 multiplied by a number gives 720. What is the number?

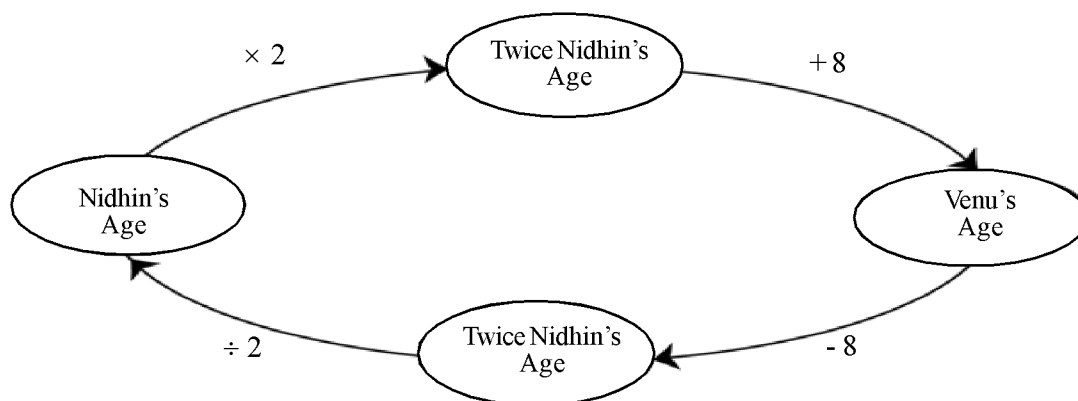*   A number divided by 21 gives 315. What is the number?

Activity 8

*   Venu's age is double that of his daughter. If Venu's age is 58, find daughter's age.

*   Venu's age is 8 more than two times his son Nidhin's age. If Venu's age is 5, find Nidhin's age.
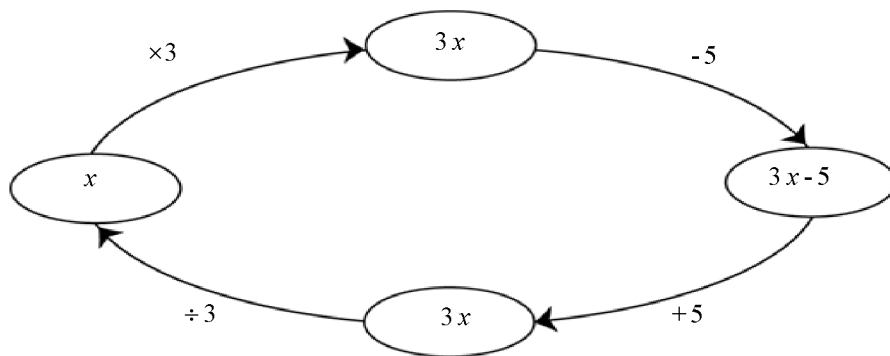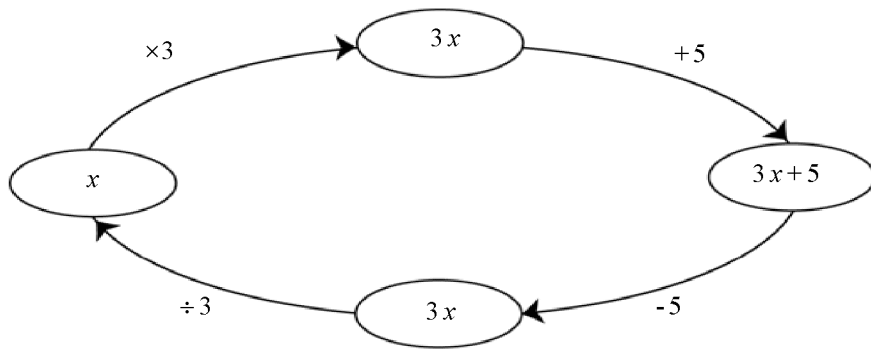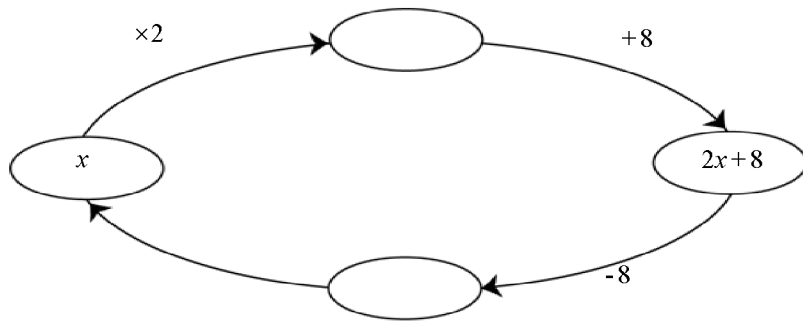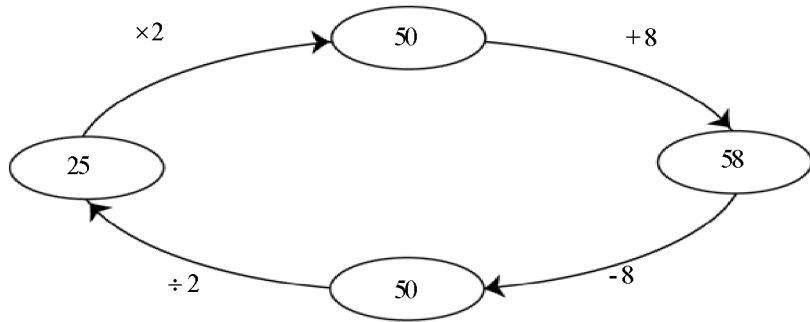
    Venu's age $= 58$

    Nidhin's age $\times 2 + 8 = 58$

    Nidhin's age $\times 2 = ?$

    Nidhin's age $\quad = ?$

Check the operations given below.

Diagram 1: $25 \xrightarrow{\times 2} 50 \xrightarrow{+8} 58 \xrightarrow{-8} 50 \xrightarrow{\div 2} 25$

Diagram 2: $x \xrightarrow{\times 2} \bigcirc \xrightarrow{+8} 2x+8 \xrightarrow{-8} \bigcirc \xrightarrow{\div 2} x$

Diagram 3: $x \xrightarrow{\times 3} 3x \xrightarrow{+5} 3x+5 \xrightarrow{-5} 3x \xrightarrow{\div 3} x$

Diagram 4: $x \xrightarrow{\times 3} 3x \xrightarrow{-5} 3x-5 \xrightarrow{+5} 3x \xrightarrow{\div 3} x$

Mathematics

Complete the missing numbers.
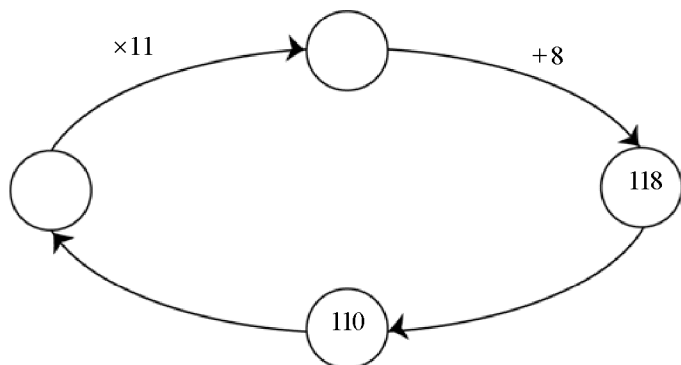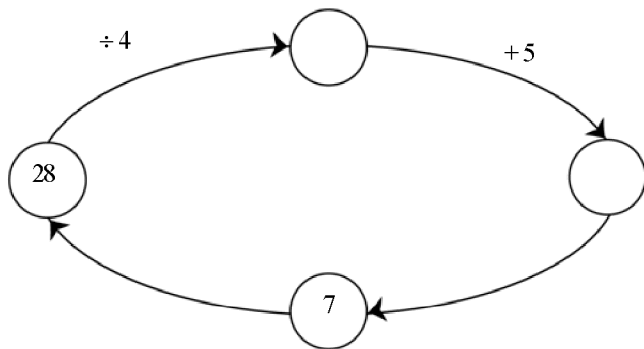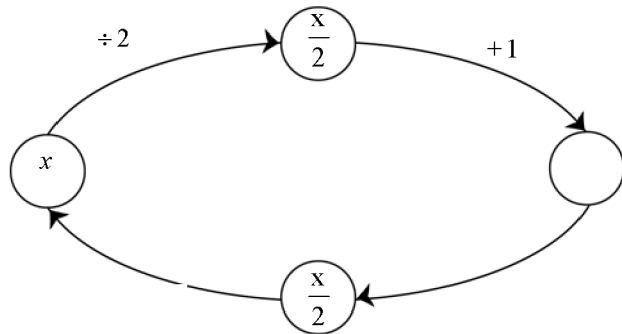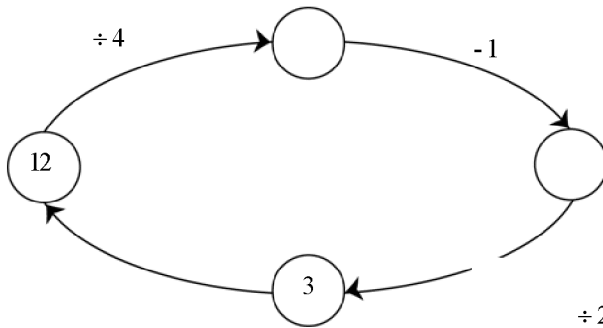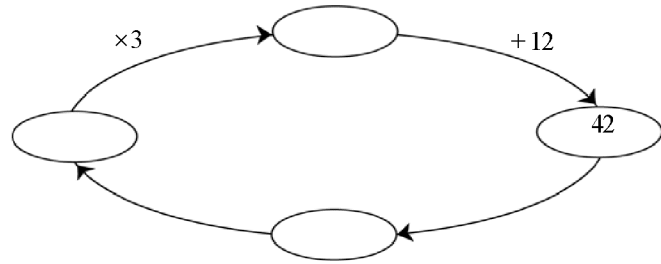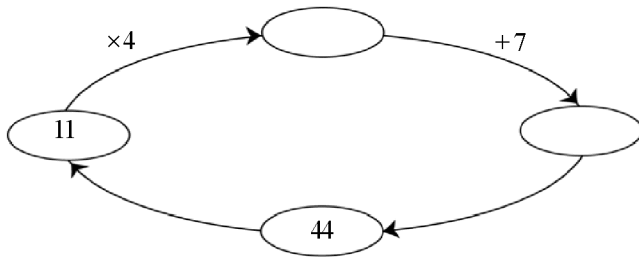
Activity 9

Convert the following algebraic sentences to verbal sentences.

$2x + 1 = 17$	• 1 added to twice a number gives 17. • 1 added to twice Venu's age gives 17. • • • •

(Write maximum verbal sentences.)

$7x - 1 = 24$	• • • • • •

$\dfrac{x}{2} + 3 = 11$	• • • • • •

$\dfrac{x}{4} - 15 = 5$	• • • • • •

3. Polygons

Activity 1

Draw a line of length 5 centimetres.

Name the line as AB.

A ――――――――――――― B

Draw another line of length 6 centimetres from A.

Name it as AC.
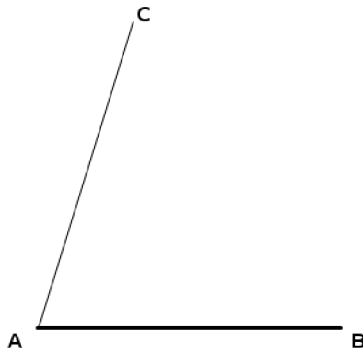
Join B and C.
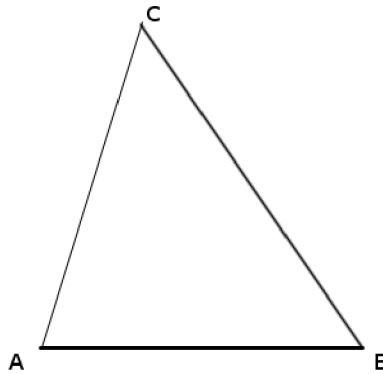
a) Give suitable name for the figure.

b) How many sides does it have? Which are the sides ?

c) How many angles does it have? Which are the angles ?

d) Find the sum of angles.

Activity 2

Draw two lines from B and C outside the triangle such that they meet at D.

Activity 3
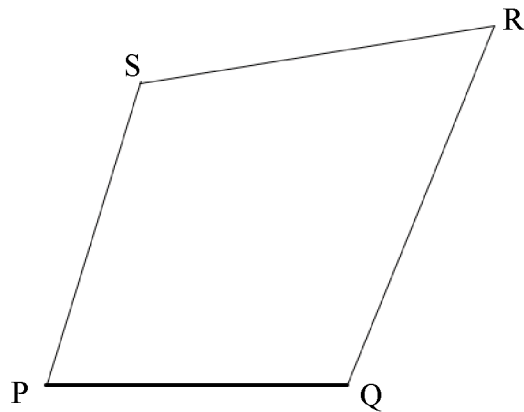
a)   Give suitable name for the figure.

b)   How many sides does it have?

c)   How many angles does it have?

d)   Draw a diagonal for it .

Activity 4

Consider the triangles given below.

1)
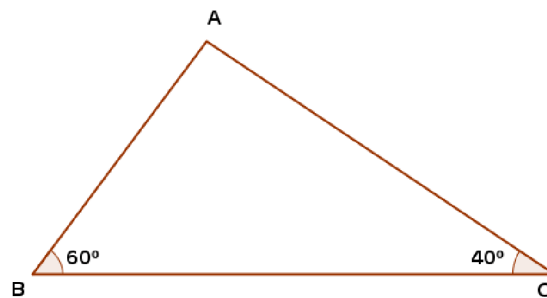
a) What is $\angle B + \angle C$?

b) What is $\angle A + \angle B + \angle C$?

c) Find the measure of $\angle A$.

2)
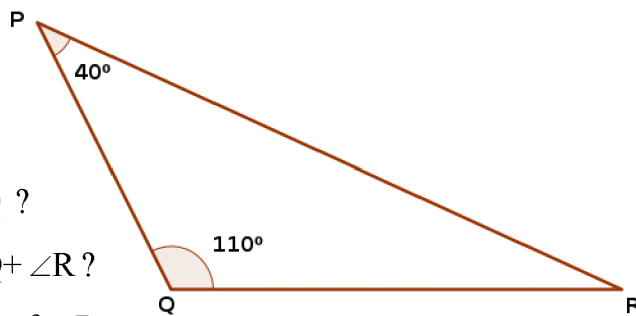
a) What is $\angle P + \angle Q$?

b) What is $\angle P + \angle Q + \angle R$?

c) Find the measure of $\angle R$

3) In the figure AB = AC , if $\angle A = 40°$

a) Find $\angle B + \angle C$.

b) What is $\angle B$?

c) Find the measure of $\angle C$.
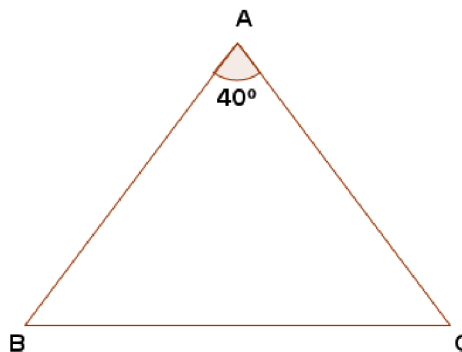
Activity 5

Draw a line OA .

Draw OB from O .
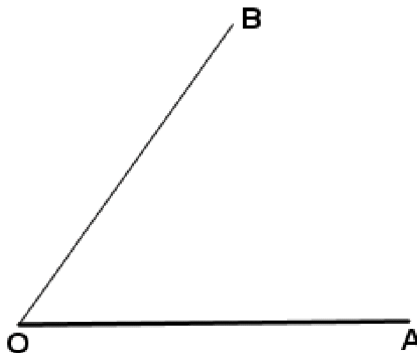
Measure $\angle AOB$.

$\angle AOB = \ldots\ldots$

Extend AO to C .

Measure $\angle COB$.

$\angle COB = \ldots\ldots$

$\angle AOB + \angle COB = \ldots\ldots$

Activity 6

In each of the figures given below, measure the second angle and find the sum of both the angles .
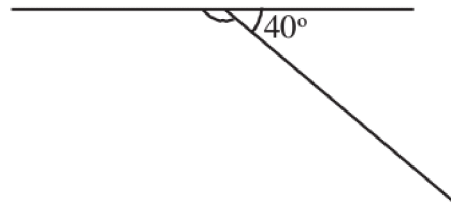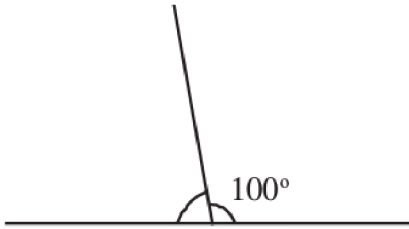
Write your findings .

＊ ＊ ＊ ＊

4. Identities

Activity 1

$1 + 2 = 2 \times 1 + 1$

$2 + 3 = 2 \times 2 + 1$

$3 + 4 = 2 \times 3 + 1$

....

....

a)   Write the next line of the above pattern.

b)   What is the principle used in the above pattern?

c)   Write the above relation using algebra.

Activity 2

$(2 + 1) + (2 - 1) = 4$

$(3 + 2) + (3 - 2) = 6$

$(3 + 1) + (3 - 1) = 6$

$(7 + 4) + (7 - 4) = $ _____
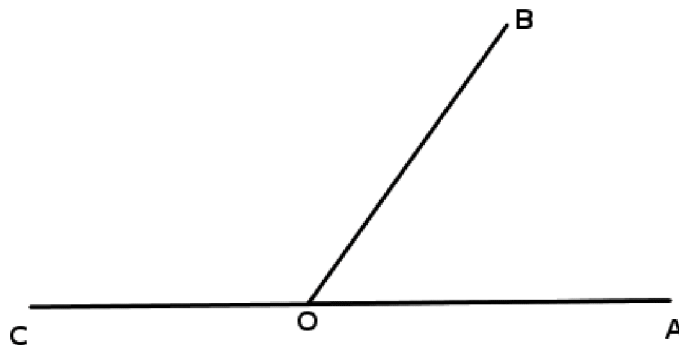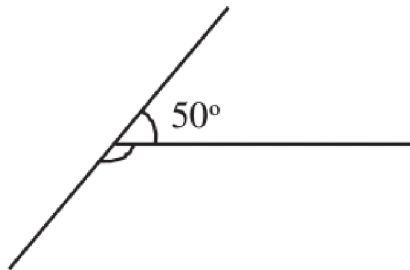
$(10 + 3) + (10 - 3) = $ _____

$(100 + 61) + (100 - 61) = $ _____

$(1000 + 867) + (1000 - 867) = $ _____

$(x + y) + (x - y) = $ _____

Activity 3

The sum and difference of certain numbers are given below. Find the numbers.

Sum	Difference	Numbers
18	2	
99	1	
199	1	
78	62	

Activity 4

Which among the following statements are true.

•   If n is any counting number then $2n$ is an odd number.

•   If n is any counting number then $2n$ is an even number.

•   If n is any counting number $(2n + 1)$ is an even number.

- If n is any counting number $(2n - 1)$ is an odd number.
- If n is any counting number, $n + 1$ is the next counting number.
- If n is any counting number then $n - 1$, n, $n + 1$ are consecutive counting numbers.
- If n is any counting number $n - 2$, n, $n + 2$ are consecutive even numbers.
- If n is any odd counting number, $n - 2$, n, $n + 2$ are consecutive odd numbers.
- If n is any even number then $n - 2$, n, $n + 2$ are consecutive even numbers.

Activity 5

If n is a counting number, $(n + 1) + (n + 2)$ is an

a. even number

b. odd number

c. odd number or even number

Activity 6

If n is an even number then $n - 1$, $n + 1$ are

a. even numbers

b. odd numbers

c. $n - 1$ odd and $n + 1$ is even.

d. $n - 1$ is even and $n + 1$ is odd.

Activity 7

Which among the following is the general form of a two digit number?

a. $10n + m$

b. $10n - m$

c. nm

d. mn

Activity 8

If $10n + m$ is an even number.

a. Both n, m are odd numbers

b. m is an even number.

c. m is an odd number.

d. n is an even number and m is an odd number.

Activity 9

Look at the number pyramid.

Using the example shown below, fill the following number pyramids.

```
        8
     3     5
  1     2     3
```

```
        ___
     ___   ___
  2     3     4
```

```
        ___
     ___   ___
  5     7     9
```

```
        ___
     ___   ___
  4     9    14
```

```
        ___
     ___   ___
  7     9    ___
```

```
        ___
     ___   ___
  8     9    ___
```

```
        36
     ___   ___
  ___   ___   ___
```
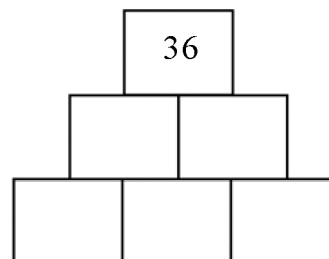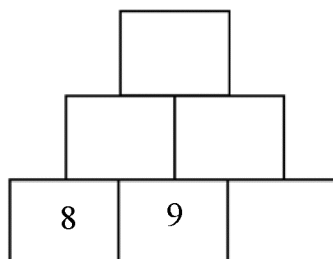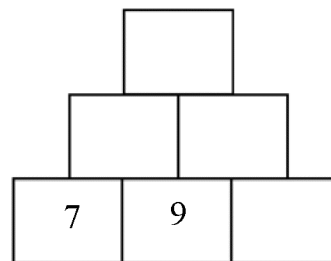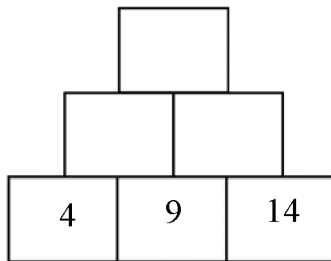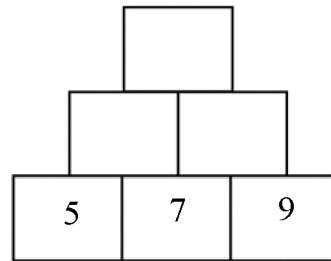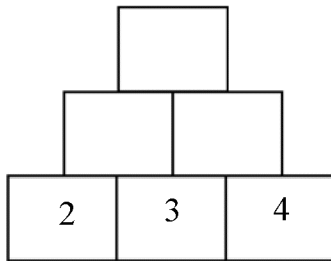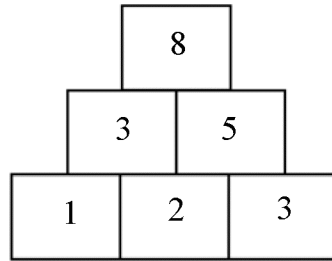
Activity 10

Write a two digit number.

Example : 25

Interchange the digits to get another number, here 52.

Find the sum of the above numbers $25 + 52 = 77$

Try this for another 2 pairs of numbers.

What is special about the sum?

Explain it using algebra.

Activity 11

Write a two digit number.

Find the sum of the digits.

Subtract this sum from the number.

Try the same set of instructions for two more numbers.

What is peculiar about the answer?

Explain the using algebra.

Activity 12

From any three digit number, if the sum of the digits is subtracted from it do we get a multiple of 9? Verify this.

$*$ $*$ $*$ $*$

5. Money Maths

Activity 1

Rate of interest

Interest on ₹ 100 for one year is called rate of interest.

i) Ravi paid ₹ 5 as interest on ₹ 100 for one year . What is the rate of interest?

<div align="center">Rate of interest = 5%</div>

ii) Thomas invested ₹ 500 in a bank. After one year he got Rs 40 as interest. What is the rate of interest?

<div align="center">Interest on ₹ 500 for one year = ... Rupees</div>

<div align="center">Interest on ₹ 100 for one year = ... Rupees</div>

<div align="center">Rate of interest = ...%</div>

iii) Anil invested ₹ 100 in a bank. After 3 years he got ₹ 24 as interest. What is the rate of interest?

<div align="center">Interest on ₹ 100 for 3 years = ... Rupees</div>

<div align="center">Interest on ₹ 100 for one year = ... Rupees</div>

<div align="center">Rate of interest = ...%</div>

iv) Reena invested ₹ 200 in a bank. After 4 years he got ₹ 48 as interest. What is the rate of interest?

<div align="center">Interest on ₹ 200 for 4 years = ... Rupees</div>

<div align="center">Interest on ₹ 100 for 4 years = ... Rupees</div>

<div align="center">Interest on ₹ 100 for 1 year = ... Rupees</div>

<div align="center">Rate of interest = ...%</div>

Interest

<div align="center">Interest = Principal x number of years x rate of interest</div>

<div align="center">I = PNR</div>

Activity 2

Babu took a loan of ₹ 20000 from a bank with interest at the rate of 12% . How much would he paid back to clear the loan after 2 years ?

$$\text{Interest} = \text{Principal} \times \text{number of years} \times \text{rate of interest}$$

$$= \text{........} \times \text{.......} \times \text{..........}$$

$$= \text{.........}$$

Amount to be paid after 2 years $= \text{........} + \text{.......}$

$$= \text{.........}$$

Activity 3

Beena took a loan of ₹ 40000 from a bank with interest at the rate of 10% .

After one year Beena paid ₹ 30000. How much would she paid back to clear the loan at the end of second year ?

$$\text{Amount borrowed in the first year} = \text{...........}$$

$$\text{Interest for the first year} = \text{.......} \times \text{.....} \times \text{......}$$

$$= \text{.........}$$

$$\text{Amount at the end of first year} = \text{..........} + \text{..........}$$

$$\text{Amount paid after one year} = \text{...........}$$

$$\text{Principal for the second year} = \text{.......} - \text{.......}$$

$$= \text{.........}$$

$$\text{Interest for the second year} = \text{.......} \times \text{.....} \times \text{......}$$

$$= \text{..........}$$

$$\text{Amount to be paid after 2 years to clear the debt} = \text{..........} + \text{..........}$$

$$= \text{.........}$$

* * * *

6. Construction of Quadrilaterals

Activity 1

Rectangle
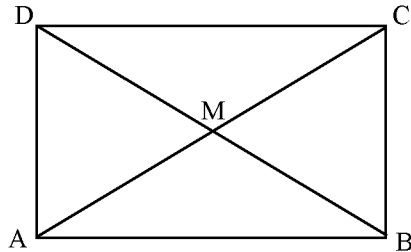
- Opposite sides are equal and parallel

  AB = DC, AD = BC

  AB ‖ DC, AD ‖ BC
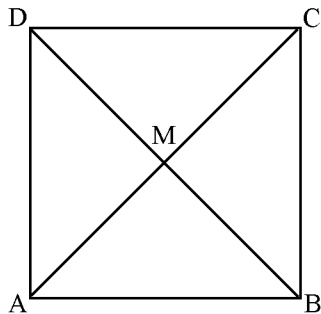
- $\angle A = \angle B = \angle C = \angle D =$ _____

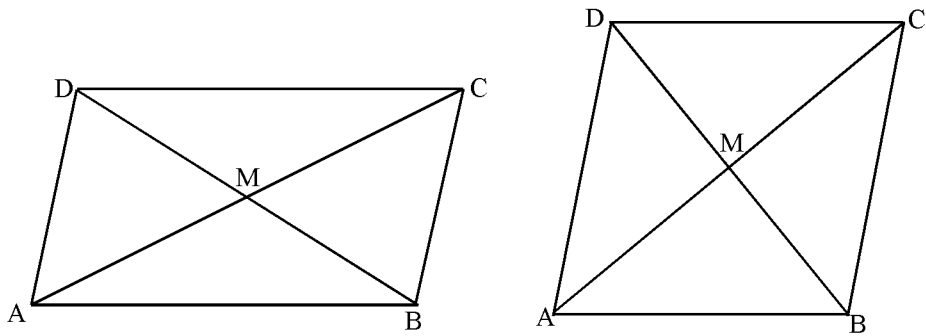- Write the peculiarity of diagonals.

Activity 2

Square

- Write the properties of a square.

Activity 3

Parallelogram and rhombus.

Compare and list the peculiarities of parallelogram and rhombus.

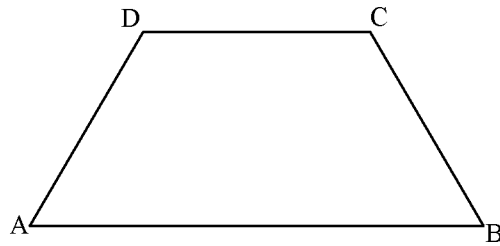|	Parallelogram	Rhombus
1		
2		
3		
4		
5		

Activity 4

Trapezium
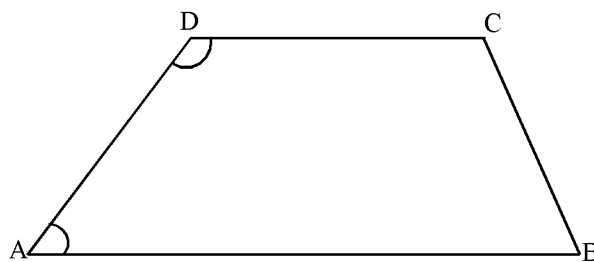
- In a trapezium, only one pair of opposite sides are parallel

  Here, AB ‖ DC

- Sum of angles on each of non-parallel sides is 180°.

$$\angle A + \angle D = 180°$$

$$\angle B + \angle C = 180°$$

Activity 5

Isosceles Trapezium

ABCD is an isosceles trapezium in which AD = BC

    a) If $\angle A = 50^\circ$ then, $\angle B =$ _____

    b) $\angle A + \angle D =$ _____

    c) $\angle C =$ _____

Activity 6

Draw a square of side 4cm in different ways.

                                            *   *   *   *

7. Ratio

Activity 1

How many metres are 25 centimetres?

100 centimetres = 1 metre

That is, 1 centimetre = $\dfrac{1}{100}$ metre

Then 25 centimetres = $25 \times \dfrac{1}{100}$ metre = $\dfrac{1}{4}$ metre

Convert the following measurements in centrimetres to metres :

50 centimetres	$\dfrac{50}{100}$ metre = $\dfrac{1}{2}$ metre
20 centimetres	$\dfrac{20}{100}$ metre = ... metre
75 centimetres	.... metre = ... metre
40 centimetres	.... metre = ... metre
60 centimetres	.... metre = ... metre

Activity 2

1000 grams = 1 kilogram

So, 1 gram = $\dfrac{1}{1000}$ kilogram

Complete the following table.

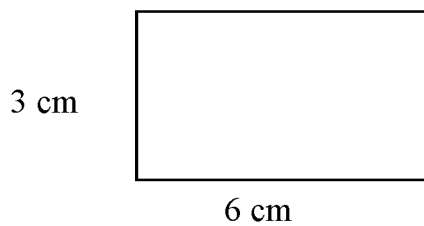| 250 gram	$\dfrac{250}{1000}$ kilogram = $\dfrac{1}{4}$ kilogram
500 gram	$\dfrac{500}{1000}$ kilogram = ... kilogram
750 gram	.... kilogram = ... kilogram
300 gram	.... kilogram = ... kilogram
450 gram	.... kilogram = ... kilogram

Activity 3

In the following figures, find the ratio between the breadth and length.

(a)

2 cm

4 cm
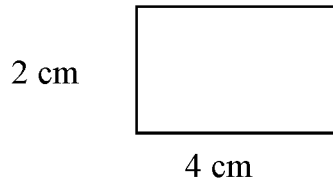
breadth : length = 2 : 4 = 1 : 2

(b)

3 cm

6 cm

breadth : length = _____

(c)

10 cm
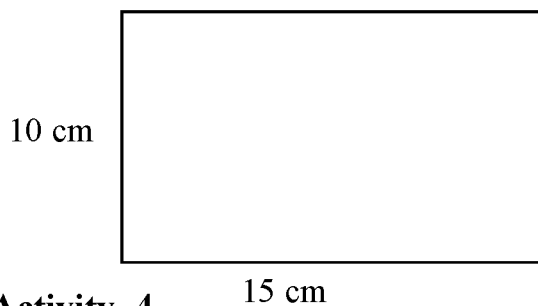
15 cm

breadth : length = _____

Activity 4

In the following questions given below, find the ratio between the numbers in the simplest form.

(a) 20, 30

(b) 12, 15

(c) 12, 18

Activity 5

In the table given below, the breadth, length and the ratio between them are given. Find the missing quantity in each of them.

Breadth (cm)	Length (cm)	Ratio
10	25	
6	9	
5		1 : 3
	20	3 : 5
14		2 : 3

Activity 6

In a class the ratio of the number of boys to girls is 5 : 7. If the number of boys is 15.

a) Find the number of girls.

b) What is the total number of students in the class ?

Activity 7

Divide the number 12 in the given ratio.

(i) 3 : 1   (ii) 1 : 2   (iii) 1 : 1   (iv) 5 : 1

Activity 8

The sides of a triangle are 6 cm, 8 cm and 10 cm respectively. Find the ratio between the sides.

Lengths of the shortest and the longest sides are in the ratio = 6 : 10 = 3 : 5 ;

Lengths of the shortest and the medium sides are in the ratio = 6 : 8 = _____

Lengths of the medium and the longest sides are in the ratio   =   _____

The sides are in the ratio = _____

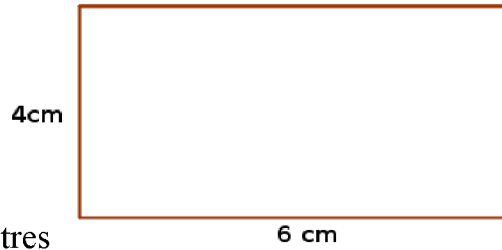* * * *

8. Area of Quadrilaterals

Activity 1

Find the area of the rectangle given below.

Area of the rectangle = length × breadth   4cm

$$= \text{........} \times \text{..........}$$

$$= \text{.........} \text{ square centimetres}$$

6 cm

Activity 2
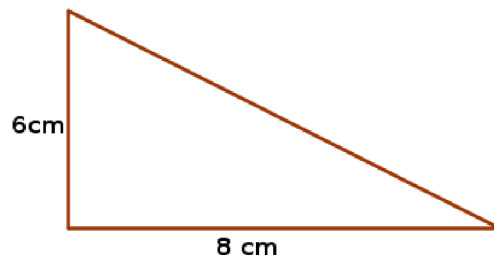
In a rectangle a diagonal is drawn.

4cm

6 cm
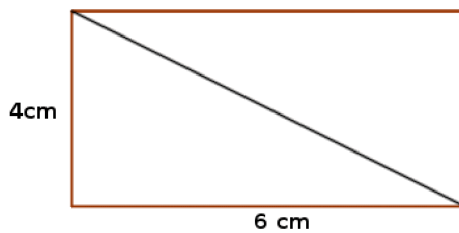
What is the area of the right angled triangles so got ?

Write the relation between area of the rectangle and area of the right triangle.

Activity 3

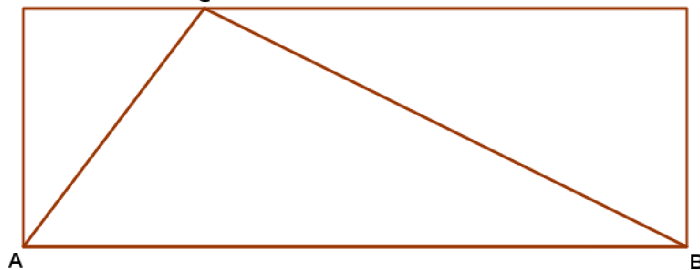Find the area of the triangle given below.

$$\text{Area} = \frac{1}{2} \times \text{........} \times \text{..........}$$

$$= \text{........} \text{ square centimetres}$$

6cm

8 cm

Activity 4

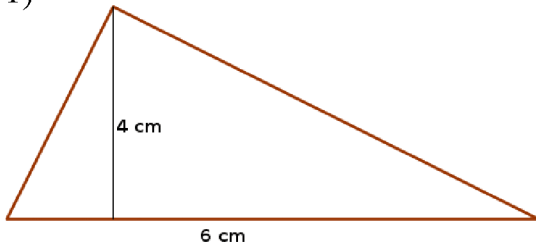The length and breadth of a rectangle are 8 centimetres and 3 centimetres .

a) Find the area of the rectangle.

b) Find the area of triangle ABC.

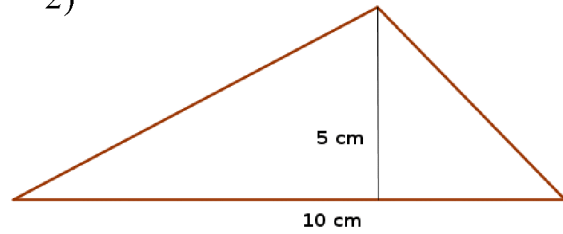c) What is the relation between area of triangle and area of rectangle?

C

A   B

Activity 5

Find the area of the triangles given below.

1)

4 cm

6 cm

2)

5 cm

10 cm

Activity 6

Write the peculiarities of the figures given below.
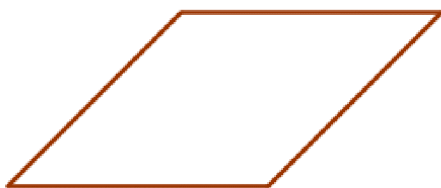
a) Rectangle

- Opposite sides of the rectangle have equal length.
-
-

b) Parallelogram

- Opposite sides of the parallelograms have equal length.
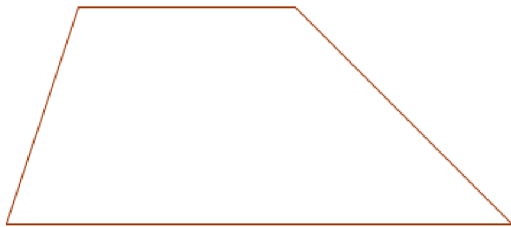-
-

c) Rhombus

- All sides are equal.
-
-

d) Square

- All sides are equal.
-
-

e) Trapezium

- A pair of opposite sides are equal.
-
-

✱ ✱ ✱ ✱

9. Negative Numbers

Activity 1

For positive numbers, the larger subtracted from the smaller is the negative of the smaller subtracted from the larger.

For any two positive numbers x, y if $x < y$ then

$x - y = -(y - x)$

Now try these problems:

    (a)   10 - 15 = -(15 - 10) = -5

    (b) 7 - 9 = -(9 - 7) = _____

    (c) 8 - 11   = _____

    (d) 15 - 20   = _____

    (e) 50 - 100 = _____

    (f)   10 - 17 = _____

Activity 2

Adding to the negative of a positive number, a second positive number means subtracting the first number from the second number.

For any two positive numbers x and y,

    $-x + y = y - x$

Now try these problems:

    (a) -5 + 9   = 9 - 5 = 4

    (b) - 10 + 8 = 8 - 10 = _____

    (c) -10 + 11 = _____

    (d) -10 + 7   = _____

    (e) -15 + 9   = _____

    (f)   -30 + 20 = _____

Activity 3

Subtracting a positive number from the negative of a positive number, we get the negative of the sum of these positive numbers.

For any positive numbers x and y,

$-x - y = -(x+y)$

Now try these problems:

(a) $-3 - 5$ $= -(3 + 5) =$ -8

(b) $-10 - 8 = -(10 + 8) =$ _____

(c) $-8 - 7$ $=$ _____

(d) $-10 - 15 =$ _____

(e) $-5 - 20 =$ _____

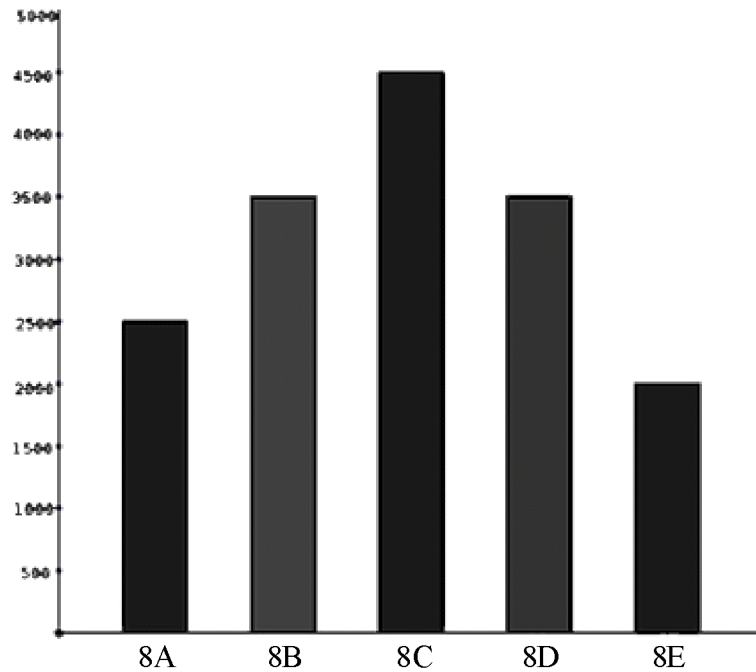(f) $-30 - 20 =$ _____

* * * *

10. STATISTICS

Activity 1

The bar graph given below shows the amount contributed by the students of a school to Karunya medical aid fund.

a) Which class contributed the least amount ?

b) Which class contributed the highest amount ?

c) What is the amount collected from 8A?

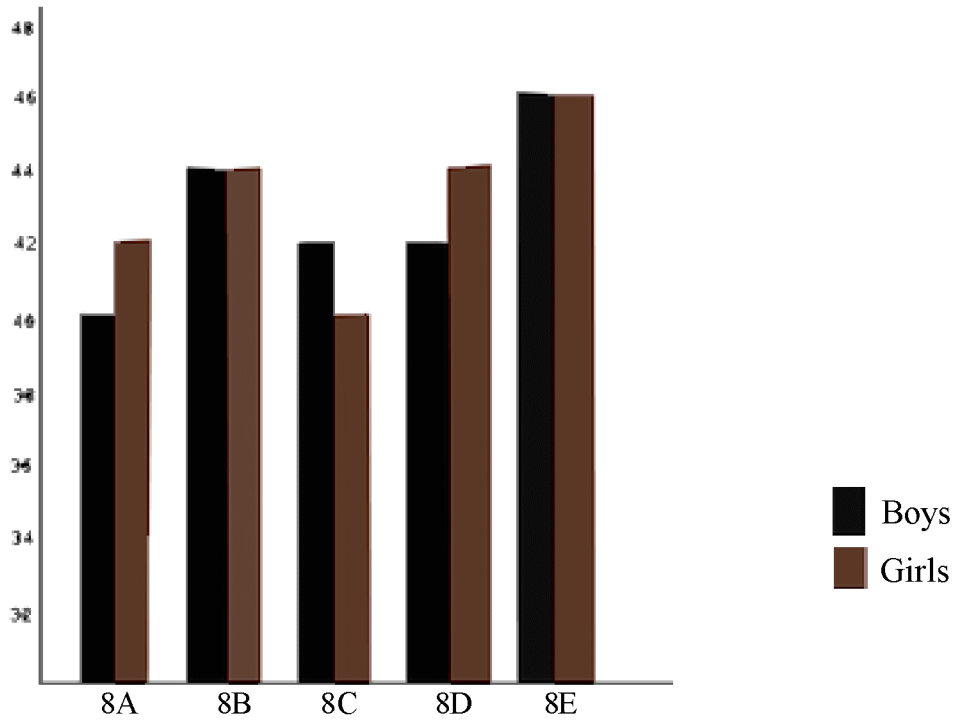d) Which classes collected the same amount ?

Activity 2

The number of students in different classes of a school are given below. Draw a bar graph according to the given details.

Class	Number of students
8A	28
8B	34
8C	36
8D	33
8E	30

Activity 3

The double bar graph given below shows the number of boys and the number of girls studying in standard VIII .

Complete the table given below .

Class	Number of boys	Number of girls
8A		
8B		
8C		
8D		
8E		

*   *   *   *