

# Mathematics

## SECOND TERM

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P R I M



الصف الرابع الابتدائي

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# ***Unit 1***



**NUMBERS  
AND**

***Operations  
ns***

## **Lessons of the unit**

- Lesson 1** The set of natural numbers
- Lesson 2** Representing natural numbers on the number line
- Lesson 3** Addition of natural numbers
- Lesson 4** Subtraction of natural numbers
- Lesson 5** Multiplication of natural numbers
- Lesson 6** Division of natural numbers





## Lesson one: the set of natural numbers

### \* Counting numbers

The set of counting numbers =  $\{1, 2, 3, 4, 5, \dots\}$

### \* The set of counting numbers

When we add zero to counting numbers, we get a new set called "The set of counting numbers" it is denoted by  $\mathbb{N}$

i.e.  $\mathbb{N} = \{0, 1, 2, 3, 4, 5, \dots\}$

Note

- ★  $\mathbb{N} =$  the set of counting numbers  $\cup \{0\}$  and  $\mathbb{N} - \{0\} =$  the set of counting numbers
- ★ The set of counting numbers is a subset of the set of natural numbers ( $\mathbb{N}$ )
- ★ The set of counting numbers and the set of natural numbers are two infinite sets.

\*\*\*\*\*

### ★ Some subsets of the set of natural numbers:

- ★ The set of even numbers:

$$E = \{0, 2, 4, 6, 8, \dots\}$$

- ★ The set of odd numbers :

$$O = \{1, 3, 5, 7, 9, \dots\}$$

- ★ The set of prim numbers  
 $= \{2, 3, 5, 7, 11, 13, \dots\}$

- ★ All prime numbers are odd numbers except 2

- ★ The smallest prime numbers

- ★ Even number + Even number = Even number

- ★ Even number + odd number = odd number

- ★ odd number + odd number = Even number



## Exercise (1)

(1) Complete using :  $\in$  ,  $\notin$  ,  $\subset$  ,  $\not\subset$

[a]  $\{ 0 , \frac{1}{2} \}$  .....  $\mathbb{N}$

[b] 1000 .....  $\mathbb{N}$

[c] 10.1 .....  $\mathbb{N}$

[d]  $\emptyset$  .....  $\mathbb{N}$

[e]  $\{ 2 , 3 , 5 , 7 , \dots , 97 \}$  .....  $\mathbb{N}$

[f] 15 .....  $\mathbb{N}$

[g]  $\{ 3 , 4 , 5 , \dots , 30 \}$  .....  $\mathbb{N}$

[h]  $\frac{15}{5}$  .....  $\mathbb{N}$

[i]  $\{ 3 , 7 \} \cap \{ 2 , 5 \}$  .....  $\mathbb{N}$

[j]  $\{ 1 , 2 , 3 \} \cup \{ 2 , 5 , 7 \}$  .....  $\mathbb{N}$

[k] the number of people in the world .....  $\mathbb{N}$

\*\*\*\*\*

(2) Complete:

[a] The smallest natural numbers is.....

[b] The smallest counting numbers is.....

[c] The set of natural numbers that are less than 9 is.....

[d]  $\{ 3 , 9 , 6 \} \cap \mathbb{N}$  is.....

[e]  $\mathbb{N}$  - set of counting numbers = .....

[f] The least even natural numbers is.....

[g] The least odd natural numbers is.....



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[h]The least prime natural numbers is.....

\*\*\*\*\*

(3)Put the suitable sign ( $\checkmark$ ) or ( $\times$ ):

[a]  $3.2 \in \mathbb{N}$  ( )

[b]  $\{0\} \subset \mathbb{N}$  ( )

[c]  $\{0,1,2\} \cap \{0,5,10\} = \emptyset$  ( )

[d]The greatest natural numbers is  
999999999 ( )

[e]The set of natural numbers is  
a finite set ( )

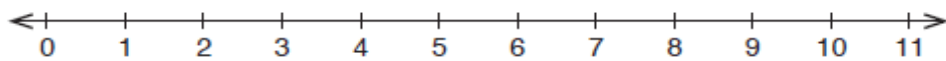


## Lesson two: Representing natural numbers on the number line

$$\mathbb{N} = \{0, 1, 2, 3, 4, 5, \dots\}$$

### Ordering and the number line

Every number can represent as a point on a straight line called number line



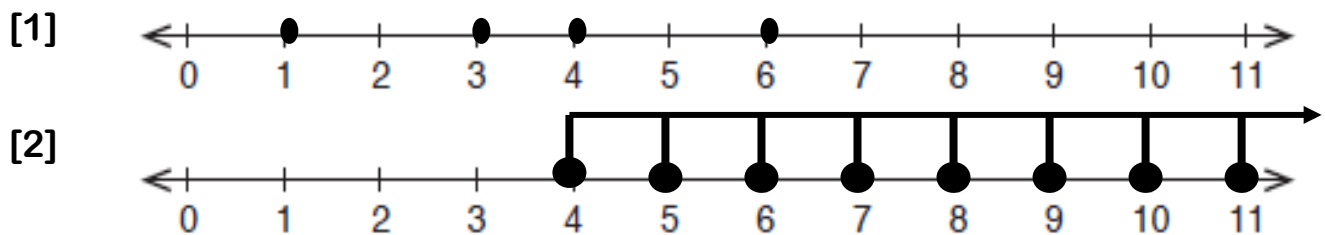
### Example [1]

Represent each of the following on the number line :

[1]  $X = \{1, 3, 4, 6\}$

[2]  $Y = \{4, 5, 6, 7, \dots\}$

Solution

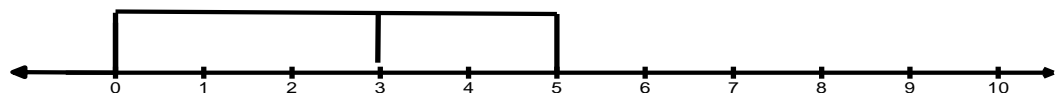


## Lesson[3] : Addition of natural numbers

Representing the natural numbers on the number line will help you to add them.

### For Example

$3 + 2 = 5$  will be shown as:



Start at 0 and move 3 units to the right. From 3 move 2 more units to the right.

This gives the answer 5





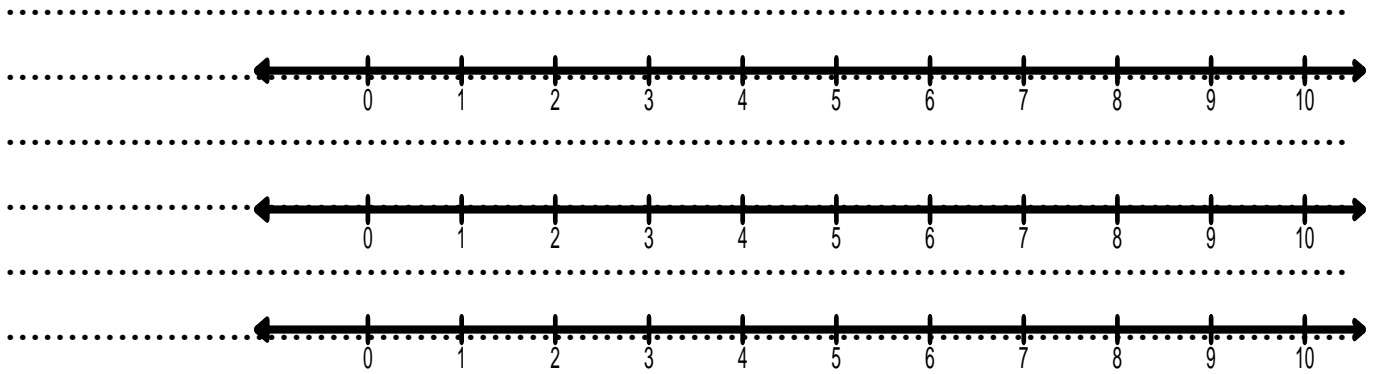
## Drill

Use the number line to add the following natural numbers.

( a )  $5 + 3$

( b )  $1 + 6$

( c )  $5 + 1$



## Properties of addition of natural numbers

### ① Closure property:

★ The sum of any two natural numbers is natural number

Q: complete:

If  $a \in \mathbb{N}$ ,  $b \in \mathbb{N}$ , then  $a+b \in \mathbb{N}$  this called ..... property

### ② Commutative property:

For any two natural numbers a and b , we have  $a + b = b + a$

Q: complete:

If  $x + y = y + x$  is called..... property

### ③ Associative property:

For any three natural numbers a , b and c : we have

$$(a + b) + c = a + (b + c)$$

Q: complete:



$(13 + 36) + 45 = 13 + (36 + \dots\dots\dots)$  called  $\dots\dots\dots$  property

-----

④ The existence of the additive neutral [identity] element in  $\mathbb{N}$ :

For any natural number  $a$ , we have :  $a + 0 = 0 + a = a$

i.e. Zero is the additive neutral element in  $\mathbb{N}$

Q: complete:

★ The additive neutral element in  $\mathbb{N}$  is.....

★ If  $a + 0 = 0 + a = a$  called  $\dots\dots\dots$  property

-----

**Example [1]** Use the properties of addition to find the result.

( a )  $34 + 48 + 66$

.....

.....

.....

( b )  $59 + 42 + 41 + 36 + 58$

.....

.....

.....

( c )  $218 + 125 + 782 + 375$

.....

.....

.....

( d )  $576 + 637 + 424 + 863$

.....

.....

.....





( e )  $44 + 67 + 56 + 33$

.....

.....

.....

( f )  $572 + 324 + 176 + 447 + 428 + 253$

.....

.....

.....

## Lesson Four: Subtraction of natural numbers

Representing the natural numbers on the number line will help you to subtract them.

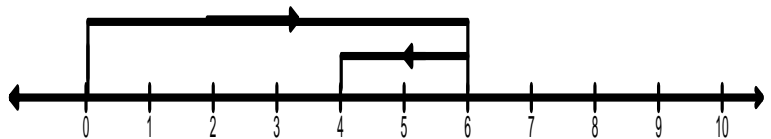
### Example (1)

$6 - 2 = 4$  will be shown as:

Start at 0 and move 6 units to the right. From 6 move 2 units to the left.

This gives the answer 4

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### Example (2)

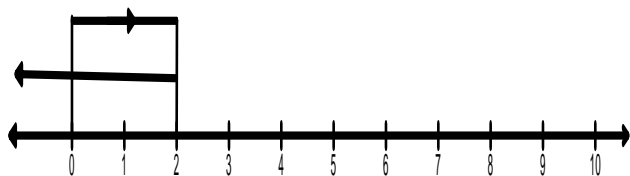
$2 - 6 =$

Start at 0 and move 2 units to the right. From 2 move 6 units to the left.

This does not give an answer in  $N$ ,

Therefore  $2 - 6$  is impossible in  $N$ .

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★ **So**, we say that Subtraction operation is not always possible in  $N$

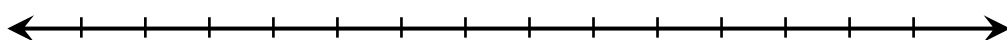


- ★ From the previous , we notice that :  $\mathbb{N}$  is not closed under Subtraction operation , and not commutative ,not associative

## Exercise

[1] represent the following operations ,if possible on number line:

1)  $4 - 3 =$  .....



2)  $5 - 2 =$  .....



3)  $4 - 9 =$  .....



[2] Complete using  $\in$  ,  $\notin$

1)  $(4 + 8)$  .....  $\mathbb{N}$

2)  $(25 - 10)$  .....  $\mathbb{N}$

3)  $(7 - 9)$  .....  $\mathbb{N}$

4)  $21985 - 9999$  .....  $\mathbb{N}$

5)  $7 - 0$  .....  $\mathbb{N}$

6)  $0 - 7$  .....  $\mathbb{N}$

[3] If  $x = 3$  ,  $y = 5$  and  $z = 8$  then find the value of the following :

1)  $X + y - 2 =$  .....

2)  $Y - x =$  .....

3)  $X + y - z =$  .....

4)  $Y + z - x =$  .....

5)  $Y + z - 10 =$  .....

[4] If  $a = 8$  ,  $b = 5$  ,  $c = 10$  and  $d = 7$  , then complete the following using  $<$  ,  $>$  or  $=$  :

1)  $a - b$  .....  $c - d$

2)  $a + b$  .....  $c - d$

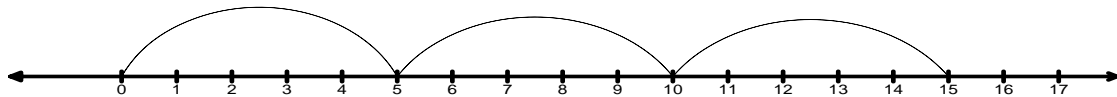
3)  $c - b$  .....  $a + 2$



- 4)  $b + 1$  .....  $c - b$   
 5)  $d - b$  .....  $a - d$   
 6)  $a + d$  .....  $b + c$

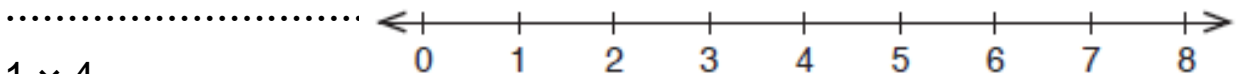
## Lesson five: Multiplication of natural numbers

We know that multiplication operation is a repeated addition operation,  $5 \times 3 = 5 + 5 + 5 = 15$ , and as addition is possible in  $\mathbb{N}$ , therefore multiplication is also possible in  $\mathbb{N}$ .

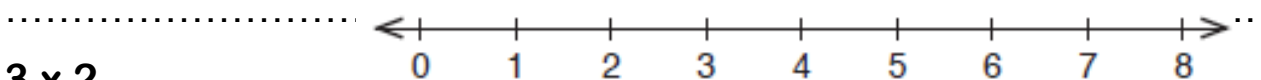


Use the number line to find the following products:

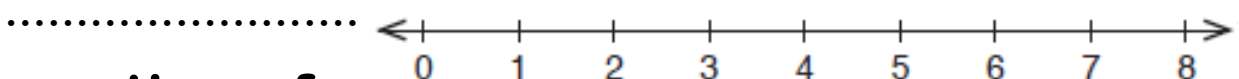
1)  $2 \times 2$



2)  $1 \times 4$



3)  $3 \times 2$



## Properties of multiplication in $\mathbb{N}$ :

### ① Closure property:

★ The product of any two natural numbers is natural number

**Q: complete:**

If  $a \in \mathbb{N}$ ,  $b \in \mathbb{N}$ , then  $a \times b \in \mathbb{N}$  this called ..... property

### ② Commutative property:

For any two natural numbers  $a$  and  $b$ , we have  $a \times b = b \times a$



**Q: complete:**

If  $x \times y = y \times x$  is called..... property

-----

**③ Associative property:**

For any three natural numbers a , b and c : we have

$$(a \times b) \times c = a \times (b \times c)$$

**Q: complete:**

$(13 \times 36) \times 45 = 13 \times (36 \times \dots\dots\dots)$  called ..... property

-----

**④ The existence of the multiplicative neutral [identity] element in  $\mathbb{N}$ :**

For any natural number a ,we have :  $a \times 1 = 1 \times a = a$

i.e. **one is the multiplicative neutral element in  $\mathbb{N}$**

**Q: complete:**

★ The multiplicative neutral element in  $\mathbb{N}$  is.....

★ If  $a + 0 = 0 + a = a$  called ..... property

-----

**⑤ Multiply by zero:**

$$5 \times 0 = 0, 0 \times 10 = 0$$

If  $a \in \mathbb{N}$  then  $a \times 0 = 0 \times a = 0$

**Any number X zero = zero**



## ⑥ Distribute multiplication over addition and subtraction

If  $a$ ,  $b$  and  $c$  are three natural numbers then

★  $a \times (b + c) = a \times b + a \times c$

★  $a \times (b - c) = a \times b - a \times c$

**ex**

Use the distributive property of multiplication over addition and subtraction to simplify:

1)  $175 \times 74 + 175 \times 26$

.....

.....

.....

2)  $67 \times 99$

.....

.....

.....

3)  $36 \times 101$

.....

.....

.....

4)  $27 \times 243$

.....

.....

.....



## Lesson six: division of natural numbers

We know that  $6 \div 3 = 2$  because  $(2 \times 3 = 6)$

Then  $6 \div 5$  is impossible in  $N$  this means



That division operation is not always possible in  $N$

### Important Remarks:

★ Zero  $\div 5$  or  $\frac{\text{zero}}{5} = \text{zero}$

But  $5 \div \text{zero}$  or  $\frac{5}{\text{zero}}$  has no meaning



Division any number by zero has no meaning





# *Unit 2*

## **EQUATIONS AND NUMBER PATTERNS**

Lessons of the unit

**Lesson 1** Equations - Number sentences - Inverse operations  
Applications and problem solving.

**Lesson 2** Number patterns





## Lesson (1) Equations - Number sentences - Inverse operation - Applications and problem solving.



### Equations



★The equation: is a mathematical sentence includes equality relation between two sides.

The statement  $x + 5 = 9$  is called equation

★The replacement set

Is a set of numbers, its elements can be used to replace the unknown (symbol) in both sides of the equation to test whether its true or not.

★Solution of the equation

Solving the equation means find the value of the symbol

ex

1) **Solve:**  $x + 6 = 13$  for the replacement set  $\{ 5, 6, 7 \}$

.....

.....

.....

.....

2) **Solve:**  $a - 1.2 = 0.7$  for the replacement set  $\{ 1.8, 1.9, 2.0 \}$ .

.....

.....

.....

.....

3) **Solve:**  $x \div 7 = 49$  for the replacement set  $\{ 7, 49, 343, 2401 \}$ .

.....

.....

.....

.....

4) The replacement set for  $y$  is the set of natural numbers.  
Find all solutions of  $2 \times y = 5$

.....

.....



.....  
.....



**Put the suitable signs + , - , × , or ÷ so that the equation has the given solution.**

( a )  $x \dots 17 \dots 13 = 24$  ; the solution is 20

( b )  $n \dots 12 \dots 8 = 11$  ; the solution is 36

( c )  $14 \dots t \dots 9 = 17$  ; the solution is 27

( d )  $y \dots 12 \dots 6 = 10$  ; the solution is 8

( e )  $d \dots (16 \dots 4) \dots 8 = 8$  ; the solution is 12

( f )  $27 \dots (y \dots 9) \dots 15 = 45$  ; the solution is 18

( g )  $21 \dots (19 \dots 8) \dots b = 11$  ; the solution is 3

( h )  $11 \dots (16 \dots a) \dots 4 = 59$  ; the solution is 11



### Inverse operations

- ★ Addition and subtraction are related operations, as shown by the following facts.

$$5 + 6 = 11 \quad , \quad 5 = 11 - 6$$

We say that adding a number and subtracting the same number are inverse operations.

- ★ Multiplying by a number and dividing by the same number are inverse operations.

$$4 \times 6 = 24 \quad , \quad 6 = 24 \div 4$$

- ★ We can use this relationship to help solve equations that involve: addition or subtraction and multiplication and division.



Use the inverse operation to write a related equation and solve for the variable.

a)  $x + 9 = 35$

.....  
.....  
.....

b)  $y - 12 = 18$

.....  
.....  
.....

c)  $6r = 30$

.....  
.....  
.....

d)  $b \div 7 = 12$

.....  
.....  
.....  
.....

### Exercise

1) Use the inverse operation to write a related equation and solve for the variable.

(a)  $x + 8 = 15$

(e)  $a + 17 = 17$

(b)  $y - 9 = 14$

(f)  $j - 54 = 61$

(c)  $3c = 27$

(g)  $42n = 42$

(d)  $n \div 6 = 9$

(h)  $m \div 3.27 = 6$



## Applications and problem solving

★ To solve problem using symbols, you must often translate word phrases about numbers into numerical or variable expressions.

★ Formulas are equations that state rules about measurements.

Here are three formulas:

★ Area of rectangle = length of rectangle  $\times$  width of rectangle.

$$A = L \times w$$

★ Perimeter of rectangle =  $(2 \times \text{length}) + (2 \times \text{width})$ .

$$P = 2L + 2w$$

★ Cost = number of items  $\times$  price per item.

$$C = n \times p$$



### Complete:

- A rectangle has length 100 units and width  $d$  units. the area is .....
- A rectangle has length 16 cm and width  $w$  cm. perimeter is..... cm.
- You buy 5 pencils at  $x$  pt each and 3 rulers at  $y$  pt each. The total cost is (.....) pt.



### Write an equation for each word sentence.

- The difference of the number  $t$  and nine is fifty - four.

.....

- Ten is eight more than twice the number  $w$ .

.....

- Twice of the number  $a$  is ten less than three times  $a$ .

.....

- Four less than half a number.

.....



e) Seven decreased by three times a number.

f) Twice the sum of a number and three.

g) The product of five and two more than a number.

h) The difference of three times a number and one.

i) Six times the difference of a number and five.

## Lesson 2

### Numerical patterns

Is a sequence of numbers according to a particular rule.

$N = \{0, 1, 2, 3, 4, 5, \dots\}$

Natural numbers (N) represents a sequence of numbers according to a particular rule which is :  
(( Each number is more than its predecessor by one ))

The set of odd numbers =  $\{1, 3, 5, 7, \dots\}$

The set of even numbers =  $\{0, 2, 4, 6, \dots\}$

both are also a sequence of numbers according to the rule:

(( Each number is more than its predecessor by 2 ))

### Pascal's triangle

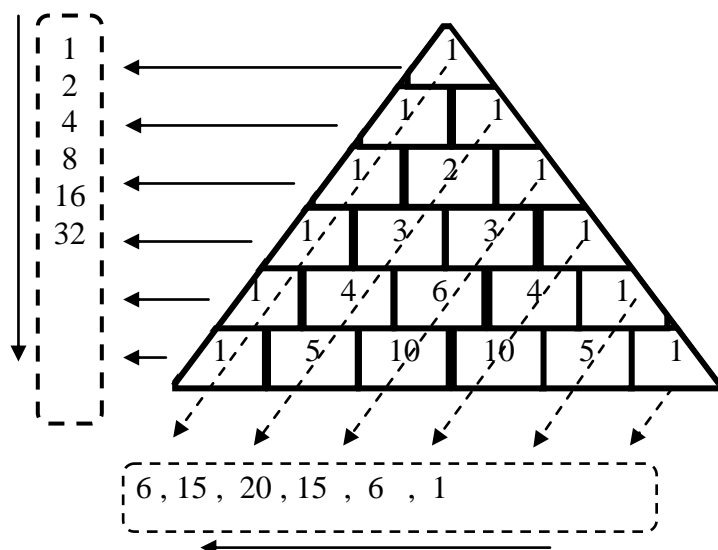
In the Pascal's triangle figure,  
the pattern of each of :

(a) The sum of numbers of the rows

1 , 2 , 4 , 8 , 16 , 32 , .....

(b) the diagonals

1 , 6 , 15 , 20 , 15 , 6 , .....



Describing of the pattern : Means discovering the rule of the pattern  
and expressing it in words.



<i>The numerical pattern</i>	<i>Description of the pattern</i>
1 , 4 , 7 , 10 , 13 , ....	each number is more than its predecessor by 3.
1 , 2 , 4 , 8 , 16 , ....	each number is twice of its predecessor.
256 , 128 , 64 , 32 , ...	each number is half of its predecessor.
50 , 45 , 40 , 35 , 30 , ...	each number is less than its predecessor by 5.

1- Complete the following table :

<i>The numerical pattern</i>	<i>Description of the pattern</i>
3 , 7 , 11 , 15 , 19 , 23 , .....	.....
.....	Each number is more than its predecessor by 5.
....., $\frac{5}{4}$ , 1, $\frac{3}{4}$ , $\frac{1}{2}$ , $\frac{1}{4}$	.....
.....	Each number is less than its predecessor by 4.
3 , 9 , 27 , 81 , .....	.....

2- Complete the following numerical patterns by writing three consecutive numbers :

(a) 6 , 14 , 22 , 30 , 38 , ..... , ..... , .....

(b)  $\frac{1}{2}$  ,  $\frac{1}{4}$  ,  $\frac{1}{8}$  ,  $\frac{1}{16}$  , ..... , ..... , .....

(c) 2 , 3 , 5 , 8 , 13 , ..... , ..... , .....

(d) 1 , 4 , 9 , 16 , 25 , ..... , ..... , .....

3- Discover the rule of the numerical pattern and write the missing numbers in each case:

# Mathematics

- 
- (a) 4 , 7 , ..... , 13 , 16 , ..... , .....  
(b) 7 , ..... , 15 , 19 , 23 , ..... , .....  
(c) 0.5 , 1 , ..... , 2 , 2.5 , ..... , .....  
(d) 128 , 64 , ..... , 16 , 8 , ..... , .....  
(e) ..... , 15 , 12 , 9 , ..... , .....







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# ***Unit 3***

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## **GEOMETRY**

Lessons of the unit

**Lesson 1** Graphing points and figures.

**Lesson 2** Geometric transformations.

**Lesson 3** Reflection.

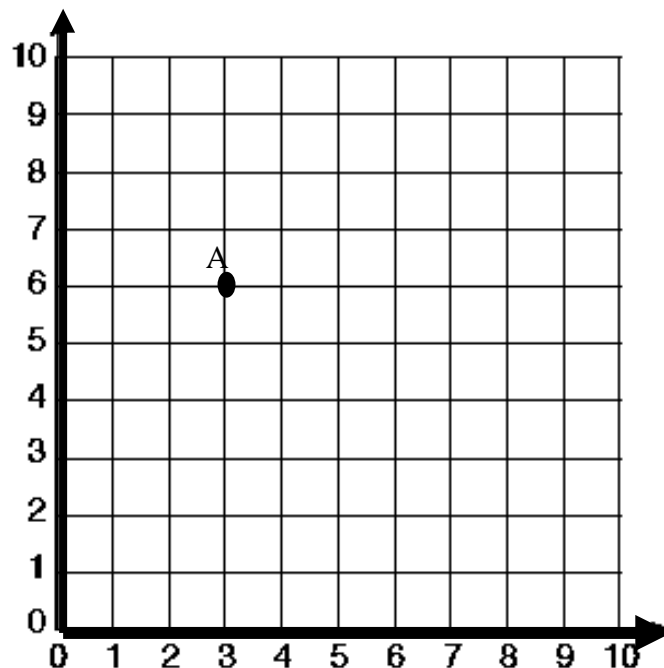
## Lesson 1

### Graphing points and figures



#### Graphing points

- ★ If we have a grid like the opposite we can describe each point of intersection of the two vertical and horizontal lines.
- ★ The two numbers which give the location of a point on a grid like this are called the Coordinates of the point.
- ★ Each of the two number lines is a Coordinate axis.



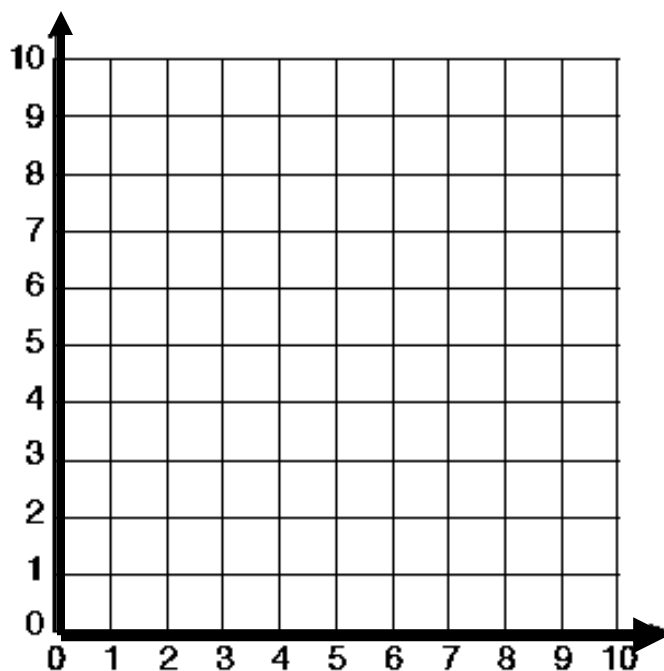
**A ( 3 , 6 )** —————→ this called an ordered pairs

↙
↘

First number                  Second number

**In the opposite : graph each the following points**

A(2, 2)                  B (4, 7)  
 C(6, 2)                  D(1, 5)  
 E(7, 5)                  F(2, 8).





## Graphing figure

The shaded figure on the opposite grid showing a rectangle formed by joining the points:

$(2,3) \rightarrow (8,3) \rightarrow (8,6)$

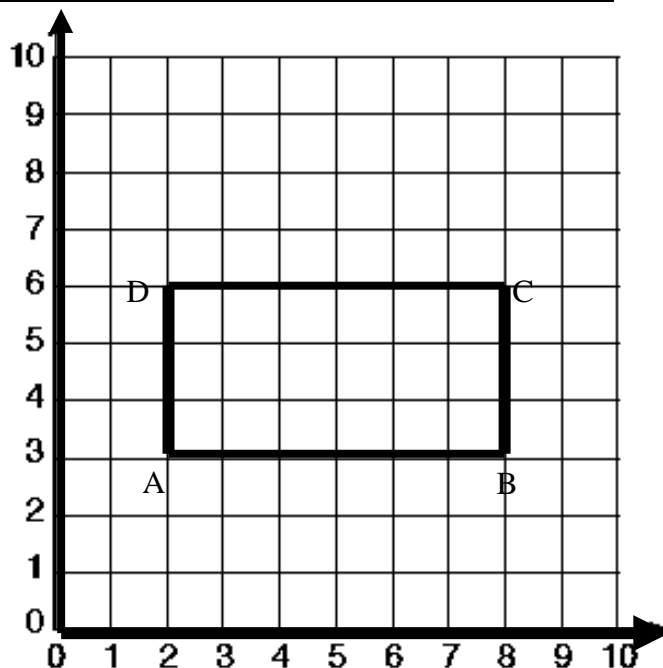
$\rightarrow (2,6) \rightarrow (2,3)$

★ Complete:

a) The length of  $\overline{AB}$  is ..... units

b) The length of  $\overline{BC}$  is ..... units

c) The coordinates of the midpoints of  $\overline{AB}$  is (..... , .....)



Which of the following pairs of figures formed by connecting the points below are congruent? Graph each figure first

( a ) Figure A:

$(1, 1), (1, 7), (4, 1), (1, 1)$

Figure B:

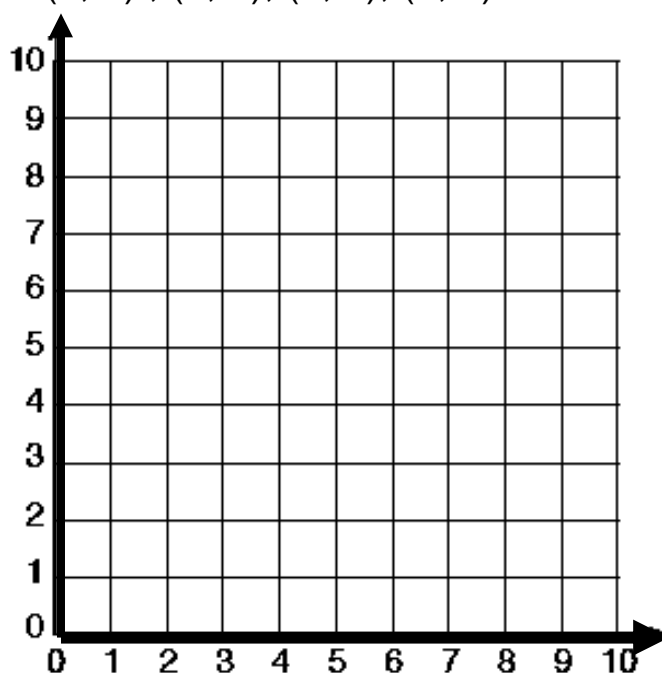
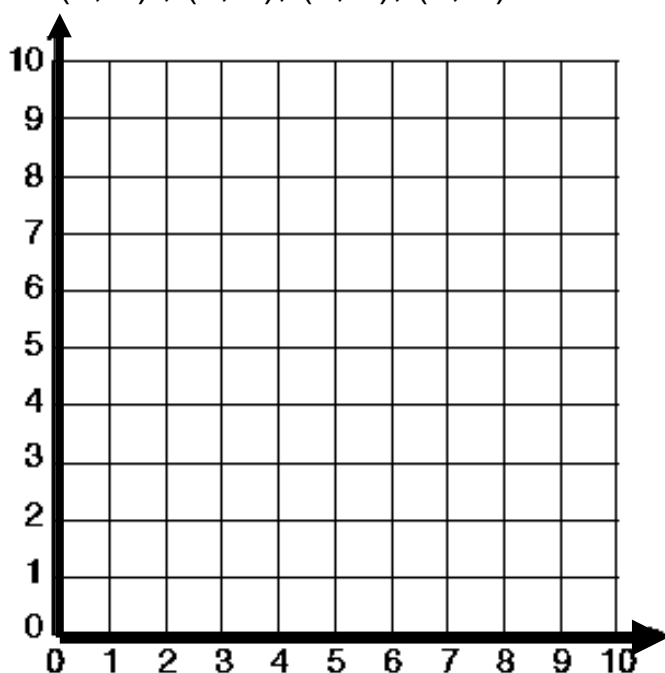
$(4, 3), (4, 9), (7, 3), (4, 3)$

( b ) Figure X:

$(1, 1), (1, 3), (3, 1), (1, 1)$

Figure Y:

$(2, 3), (2, 9), (8, 3), (2, 3)$



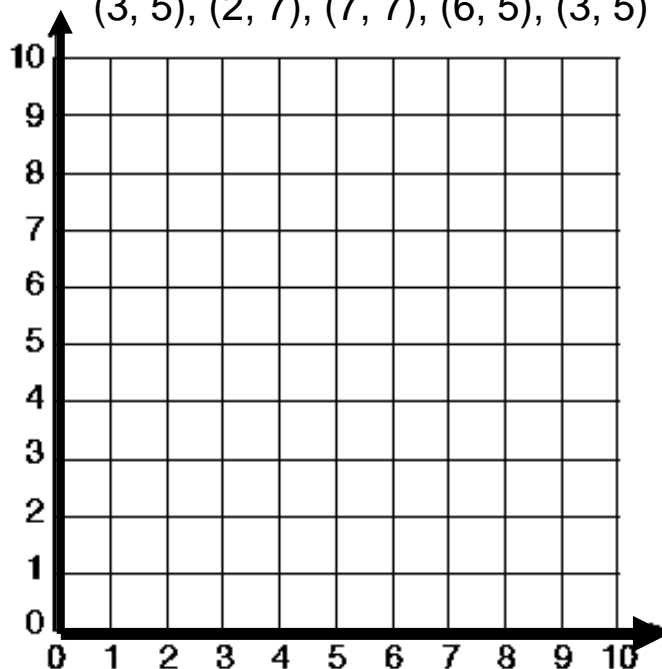


( c ) Figure C:

(2, 1), (3, 3), (6, 3), (7, 1), (2, 1)

Figure D:

(3, 5), (2, 7), (7, 7), (6, 5), (3, 5)

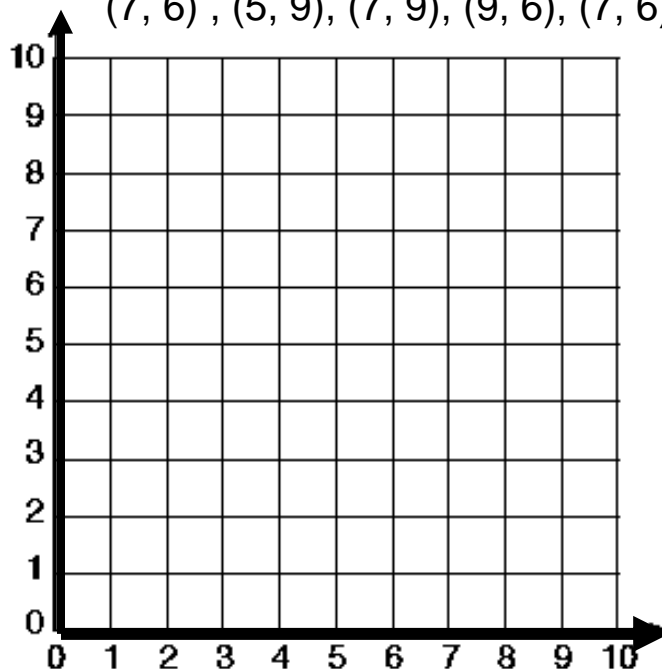


( d ) Figure E:

(6, 1), (2, 7), (6, 7), (10, 1), (6, 1)

Figure F:

(7, 6), (5, 9), (7, 9), (9, 6), (7, 6)

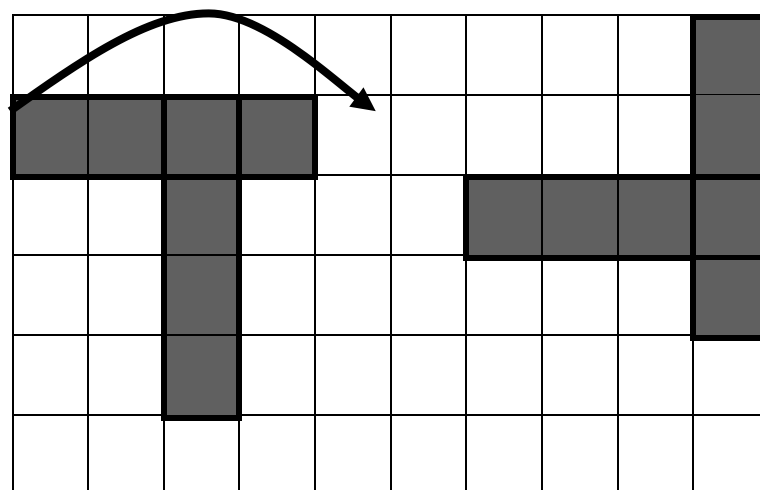
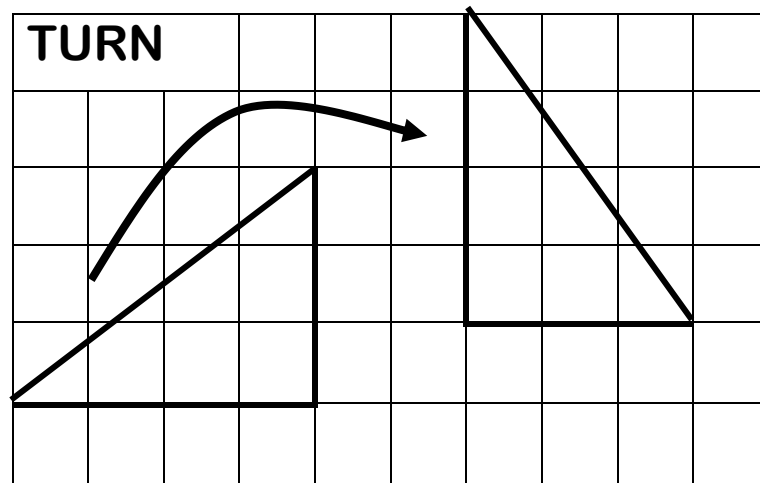


## Lesson 2

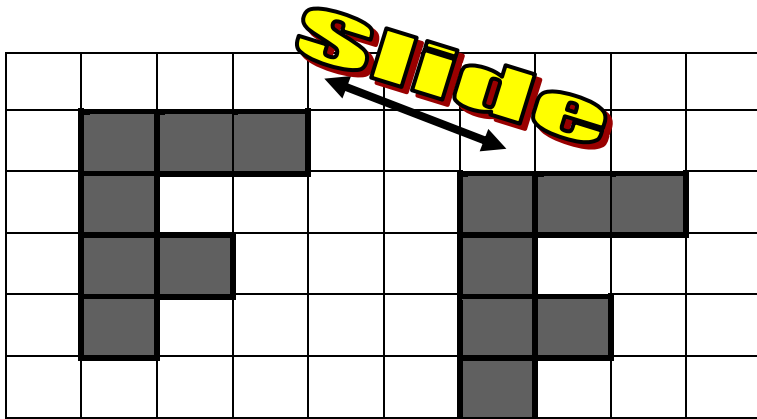
### Geometric transformation

*A transformation of a figure is produced by turning, sliding or flipping the figure*

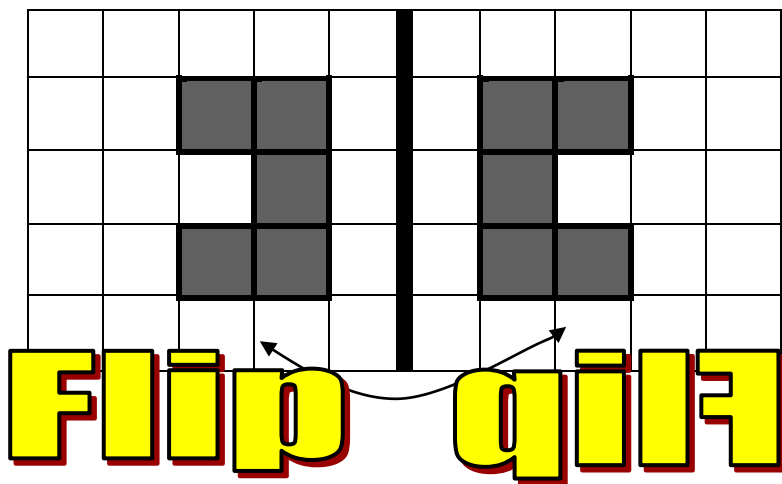
- 1) A turn image is made by moving a figure around a point



2) A Side image is made by moving a figure a long a line



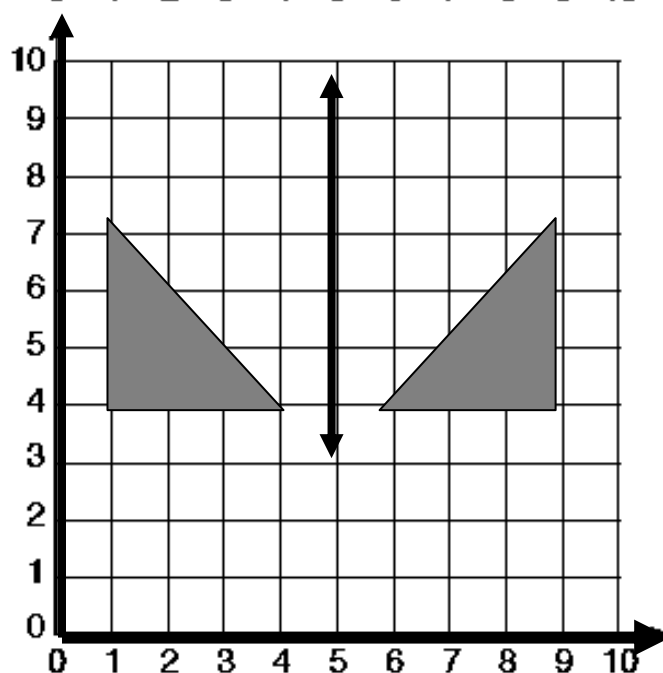
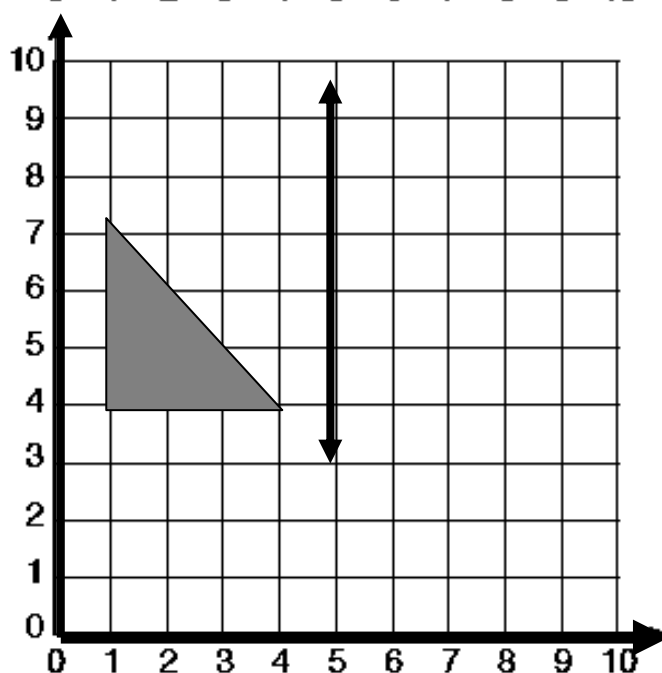
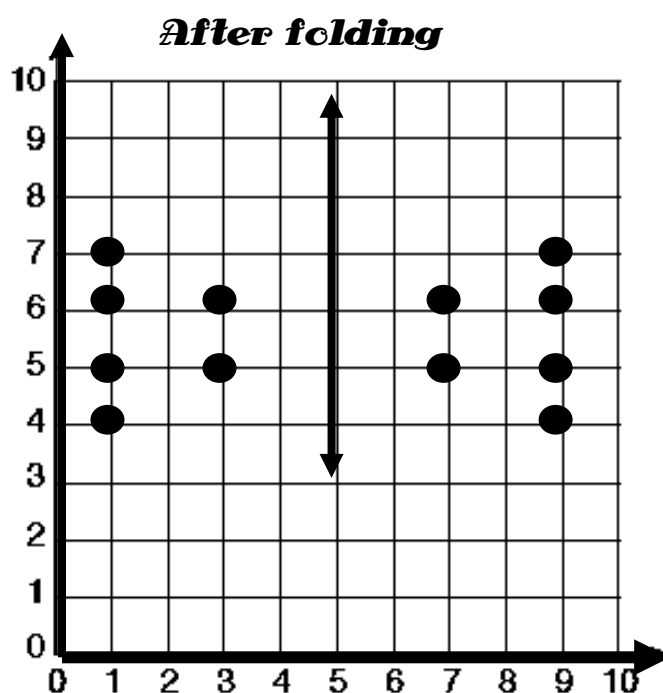
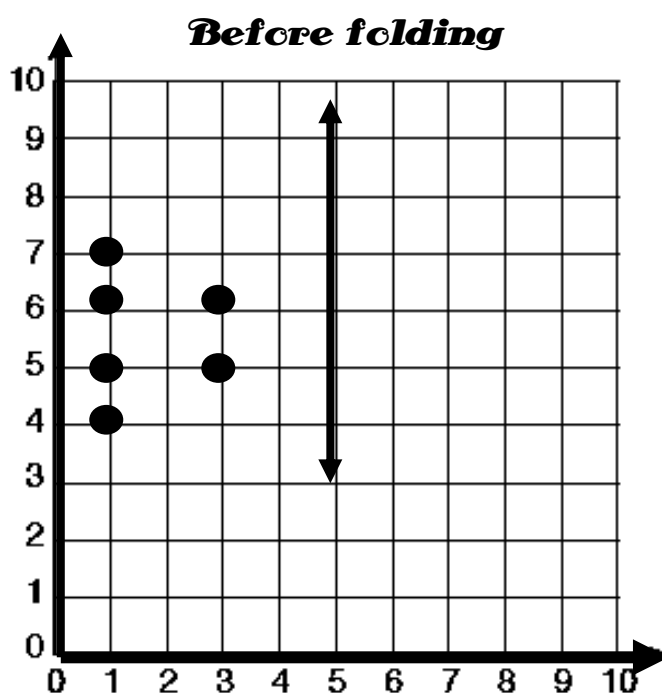
3) A flip image is made by using a line of reflection



## Lesson 3

### Reflection

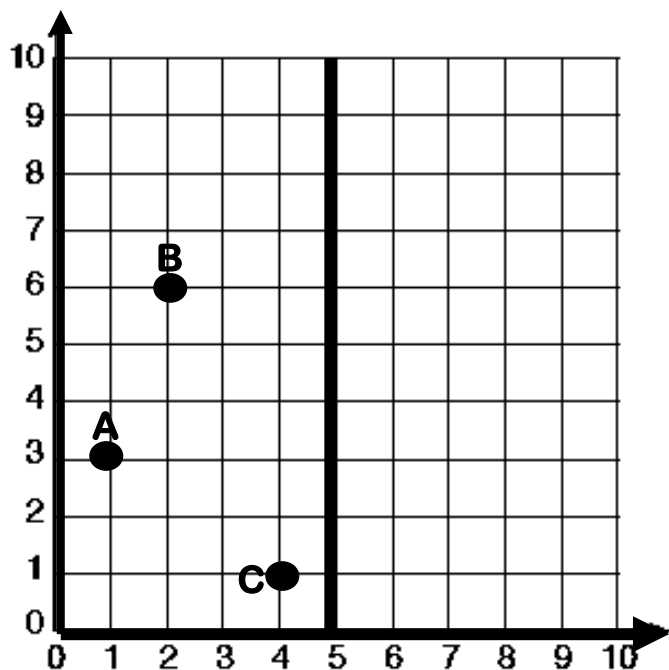
Notice how reflection about the drawn line works



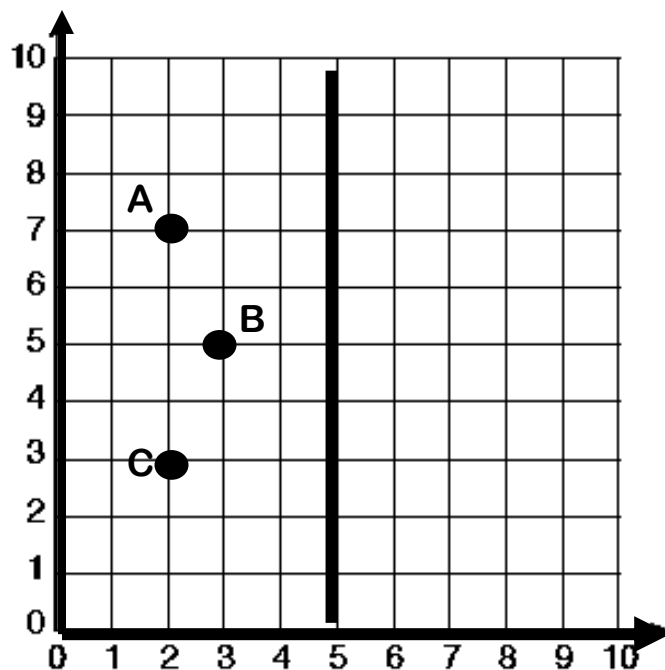


# Mathematics

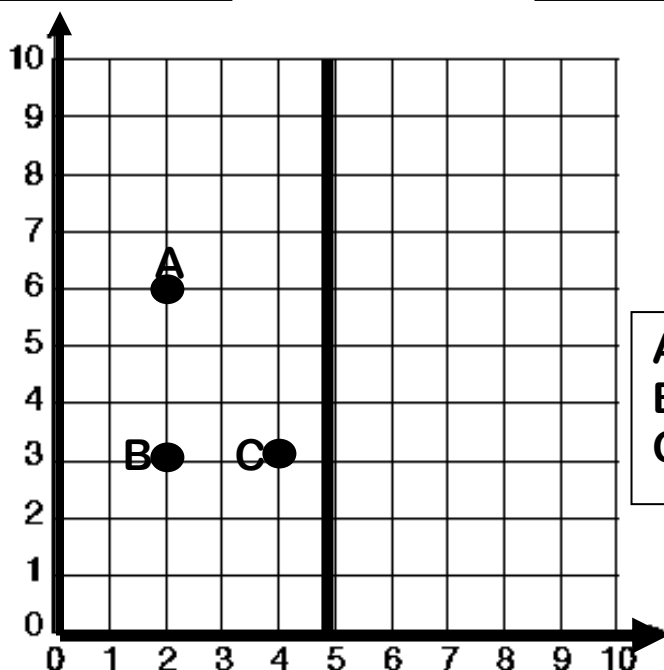
**Ex 1:** Give the coordinates of the reflection image of the points A, B, and C:



A=(..... , .....)  
B=(..... , .....)  
C=(..... , .....)



A=(..... , .....)  
B=(..... , .....)  
C=(..... , .....)



A=(..... , .....)  
B=(..... , .....)  
C=(..... , .....)



# ***Unit 4***

---

## **MEASUREMENT**

# $\pi$



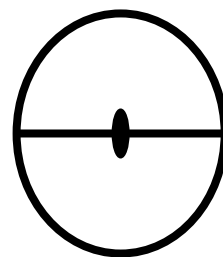
## Lesson 1

### Circumference of the circle



#### The radius(r)

- ★ The radius is the line segment joining any point on the circle and the centre of the circle



#### The diameter (d)

- ★ The diameter is the longest chord in the circle

$$d = 2r$$

\*\*\*\*\*



The length of the distance around the circle is called

**The circumference of the circle**

\*\*\*\*\*



The special factor called "Pi" and its symbol is a Greek

letter " $\pi$ " where " $\pi = \frac{22}{7}$  or  $\pi = 3.14$ "

\*\*\*\*\*

$$\pi = \frac{\text{Circumference of the circle}}{\text{Its radius}}$$

So,



$$\begin{aligned} \text{circumference} &= \pi \times \text{diameter} \\ &= \pi \times d \end{aligned}$$



$$d = \text{circumference} \div \pi$$

$$\begin{aligned} \text{circumference} &= \pi \times 2 \text{ radius} \\ &= \pi \times 2 \times r = 2\pi r \end{aligned}$$



$$r = \text{circumference} \div 2\pi$$



## Examples



1) Find the circumference of a circle with a diameter of 10 cm. “

$$\pi = 3.14$$

.....  
.....  
.....

d = .....  
 $\pi$  = .....  
C = ?

2) Find the circumference of a circle with a radius of 4 cm.

$$\pi = 3.14$$

.....  
.....  
.....

r = .....  
 $\pi$  = .....  
C = ?

3) Find the circumference of a circle with a radius of 7 cm

$$\pi = \frac{22}{7}$$

.....  
.....  
.....

r = .....  
 $\pi$  = .....  
C = ?



4) Find the circumference of a circle with a diameter of 21 cm.

$$C = \pi d$$

.....  
 .....  
 .....

d = .....

$\pi$  = .....

C = ?

5) A circle of circumference 88cm . find the length of its diameter

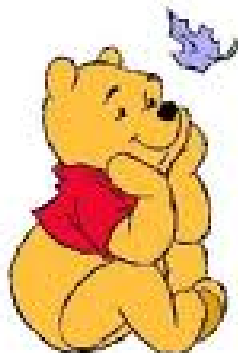
$$C = \pi d$$

.....  
 .....  
 .....  
 .....

6) A circle of circumference 66cm . find the length of its radius

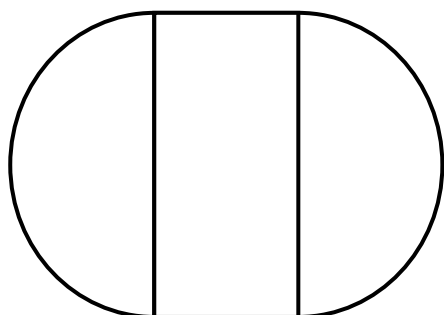
$$C = 2\pi r$$

.....  
 .....  
 .....  
 .....

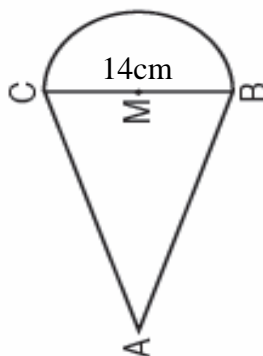




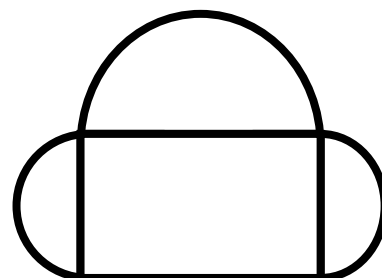
Calculate the perimeter of the following figure:



P=.....



P=.....



P=.....

( a ) Find the difference between the circumferences of two circles with radii 8.6 cm and 6.3 cm approximating the result to one decimal place. “

$\pi = 3.14$  ”

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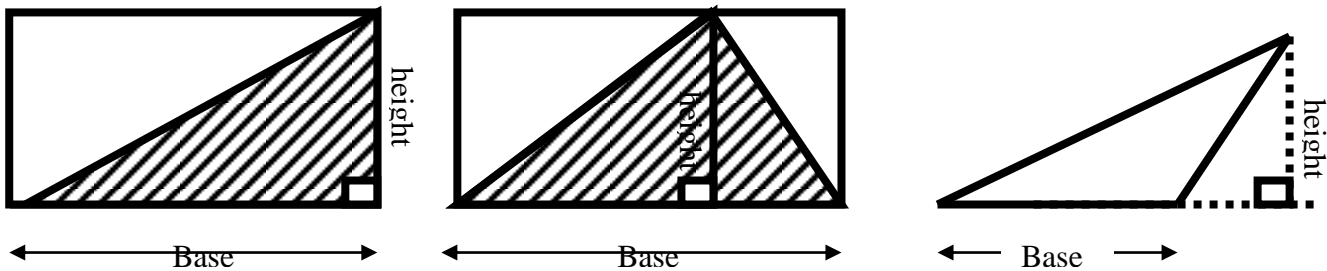
.....

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\*\*\*\*\*

## Lesson 2

### Area of a triangle



- ★ The two congruent triangles fit into one rectangle with base and height the same as the triangle so the area of the rectangle is one half the area of a rectangle :

$$\begin{aligned}
 \text{Area of a triangle} &= \frac{1}{2} \times \text{area of a rectangle} \\
 &= \frac{1}{2} \times \text{base} \times \text{height} \\
 &= \frac{1}{2} \times b \times h
 \end{aligned}$$

$$\begin{aligned}
 \text{Base} &= 2 \times \text{area} \div \text{height} \\
 \text{height} &= 2 \times \text{area} \div \text{base}
 \end{aligned}$$

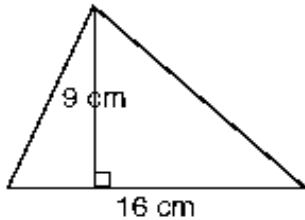






Find the area of each of the following triangles.

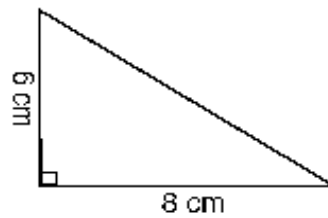
(a)



Area of the triangle =

.....  
 .....  
 .....  
 .....

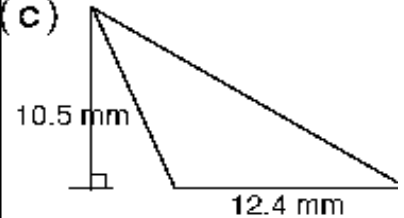
(b)



Area of the triangle =

.....  
 .....  
 .....  
 .....

(c)



Area of the triangle =

.....  
 .....  
 .....  
 .....



Which is larger in area, a piece of land in the shape of a triangle with base 10 m and height 3 m or a garden in the shape of a square with side length 5 m?

.....  
 .....  
 .....  
 .....  
 .....  
 .....



Which is larger in area, a garden in the shape of a triangle with base 8 m and height 7 m or land in the shape of a rectangle with length 8 m and width 3 m?

.....  
 .....

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.....



Calculate the area of an equilateral triangle if its perimeter is 27 cm and, its height is 7.8 cm.

.....

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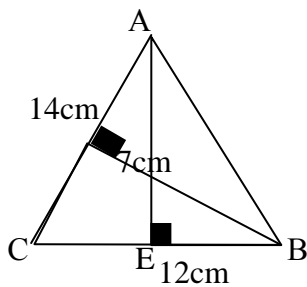
.....



Find the area of a triangle

**Find the area of each of the following figures:**

(1)



Area of  $\triangle ABC =$

.....

.....

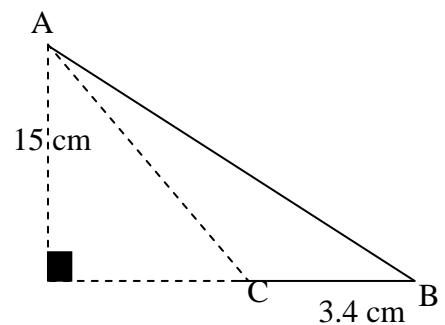
.....

.....

.....

.....

(2)



Area of  $\triangle ABC =$

.....

.....

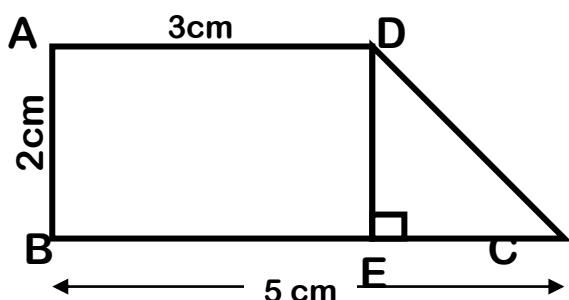
.....

.....

.....

.....

(3)



Area of the figure ABCD =

.....

.....

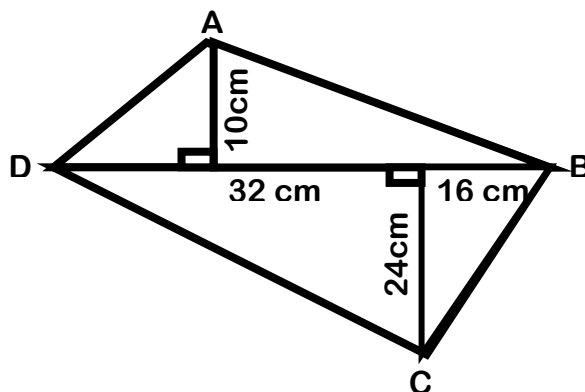
.....

.....

.....

.....

(4)



Area of the figure ABCD =

.....

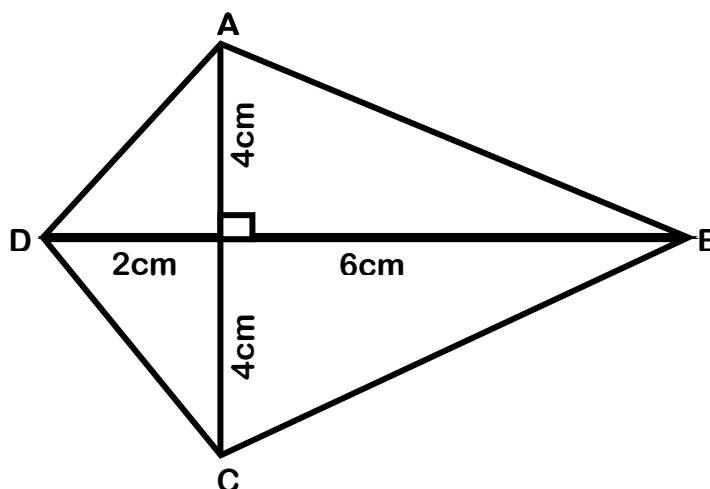
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Area of the figure ABCD =

.....

.....

.....

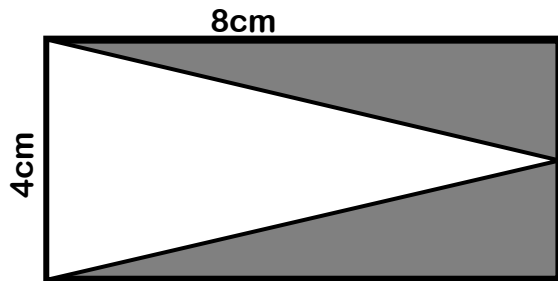
.....

.....

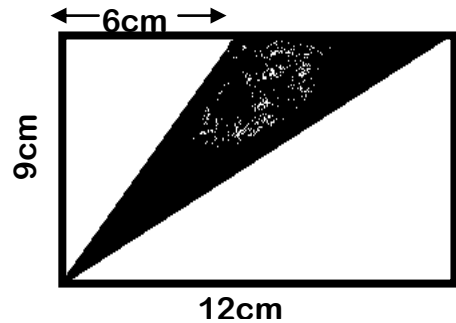
.....



Find the area of the shaded part



.....  
 .....  
 .....  
 .....  
 .....

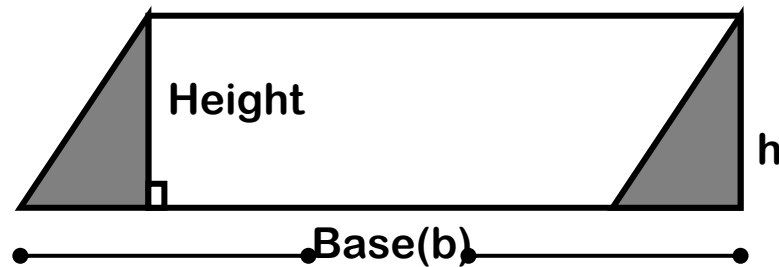


.....  
 .....  
 .....  
 .....  
 .....



## Lesson 3

### Area of a parallelogram



$$\begin{aligned} \text{Area of a parallelogram} &= \text{base} \times \text{height} \\ &= b \times h \end{aligned}$$



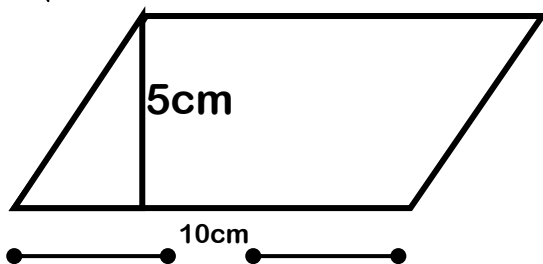
$$\text{Base} = \text{area} \div \text{height}$$



$$\text{height} = \text{area} \div \text{Base}$$



Find the area of the following parallelogram



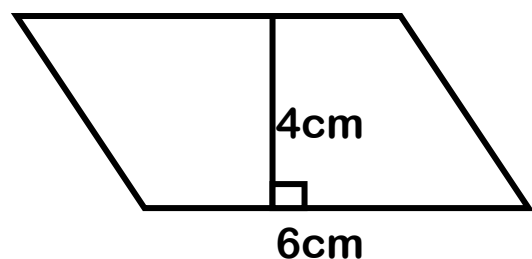
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Ex(2): A parallelogram has base of 8cm and corresponding height of 5 cm .Find its area.

.....

.....

.....

.....

Ex(3) A parallelogram of area  $63 \text{ cm}^2$  and the length of its base is 7 cm . Find the corresponding height of this base.

.....

.....

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.....

Ex(4) A parallelogram in which the length of two adjacent sides ضلعين متجاورين is 7cm and 6cm and its smallest height is 2 cm . Find its area.

.....

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**Notice that**

Area of a parallelogram =  
 The length of the smaller base  
 X the greater height  
 = The length of the greater base X  
 the smaller height

Ex(5) the length of two adjacent sides in a parallelogram are 6cm ,8cm if its greater height is 4cm ,then find the smaller height

.....

.....

.....

.....

.....

.....

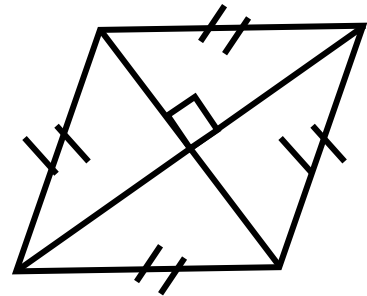
## Lesson 4

### Area of a rhombus



#### Remember that

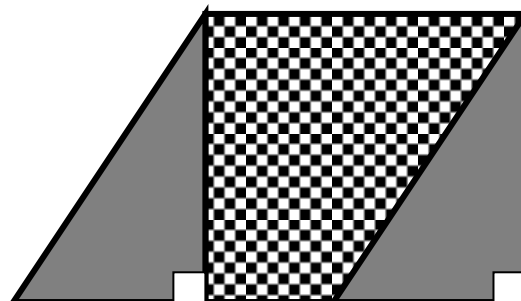
The rhombus is a parallelogram its sides are equal in length and its diagonals are perpendicular.



$$\begin{aligned} \text{Area of a rhombus} &= \text{Side length} \times \text{height} \\ &= L \times h \end{aligned}$$

$$\text{Side length} = \text{Area} \div \text{height}$$

$$\text{Height} = \text{Area} \div \text{side length}$$



[1] The lengths of the diagonals of a rhombus are 24 cm and 10 cm. Calculate its area.

Solution

.....

.....

.....

.....

.....



[2] The lengths of the diagonals of a rhombus are 12 cm and 16 cm and its height is 9.6 cm. Find its side length.

Solution

.....

.....

.....

.....

.....

[3] The side length of a rhombus is 5 cm, its height is 4.8 cm and the length of one of its diagonal is 6 cm. Calculate the length of the other diagonal.

Solution

.....

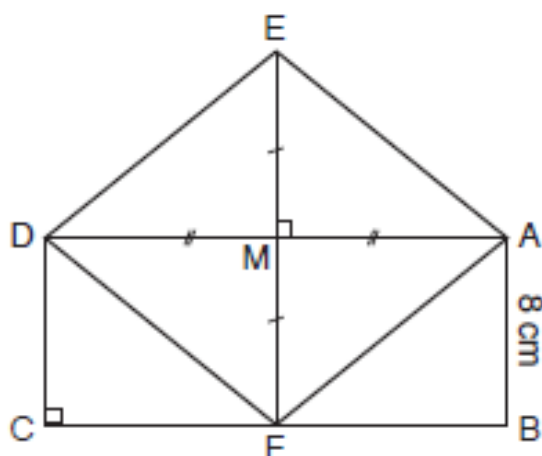
.....

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[4] In the figure opposite, area of the rectangle ABCD equals 144. If  $AB = 8$  cm, Calculate the area of the rhombus AFDE.



Solution

.....

.....

.....

.....

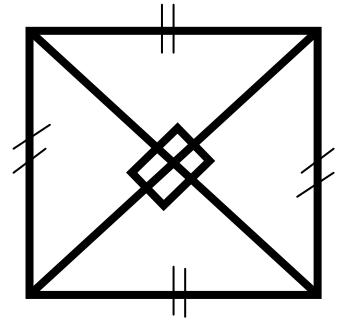
.....



## Lesson 4

### Area of a square

A square is a rectangle in which the length and the width are equal. you can find the area of a square by multiplying the length “s” of a side by itself.



**Area of a square = side length  $\times$  itself**  
**Formula:  $A = S \times S$**

Ex

1 Find the area of the square of the side length 6 cm.



Solution

Ex

2 The diagonal length of a square is 10 cm long.  
Find the area of the square.



...Solution...

Ex

3 The area of a square is 72 cm<sup>2</sup>. Find the length of its diagonal.



...Solution...

Ex

1

Two pieces of land are equal in area. the first is a square – shaped and the second is a rectangle of length 9 cm and width 4 cm. Find the perimeter of the square piece



Solution



# Final Revision

## [1] Choose the correct answer:

① The area of parallelogram = .....

- (a)  $\frac{1}{2} b \times h$       (b)  $2b \times h$       (c)  $b \times h$       (d)  $\frac{1}{4} b \times h$

②  $205 \times 13 = 200 \times 13 + \dots$

- (a) 100      (b) 50      (c) 5      (d) 1

③ when a number  $\chi$  is multiplied by 5 and 3 is add to the product ,then the result is 48 then  $\chi = \dots$

- (a) 15      (b) 18      (c) 27      (d) 9

④ if  $t = 1.7$  ,then  $2(t-1) = \dots$

- (a) 0.7      (b) 1.4      (c) 3.4      (d) 5.4

## [2] Choose the correct answer:

①  $\{2,9\} \cap \{3,7\} \dots \mathbb{N}$

- (a)  $\in$       (b)  $\notin$       (c)  $\subset$       (d)  $\not\subset$

②  $\frac{5}{0} = \dots$

- (a) 5      (b) 0      (c) possible      (d) not possible

③ if  $\frac{y}{8} = \frac{3}{4}$  , then  $y = \dots$

- (a) 24      (b) 12      (c) 6      (d) 3





④ When a whole number N is divided by 5, the quotient is 13 and the remainder is 4, what is the value of N ?

- (a) 59                      (b) 65                      (c) 69                      (d) 79



**[3] Choose the correct answer:**

①  $40 \times 97 = 40 \times 100 - 40 \times \dots\dots\dots$

- (a) 1                      (b) 2                      (c) 3                      (d) 4

②  $\frac{7-6}{6-5} = \dots\dots\dots$

- (a)  $\frac{1}{5}$                       (b) 0                      (c) 1                      (d) meaningless

③  $17M \div \dots\dots\dots = M$

- (a) M                      (b) 17                      (c) 1                      (d) 7

④ if  $\chi - 1 = 7$  then half  $\chi = \dots\dots\dots$

- (a) 8                      (b) 6                      (c) 4                      (d) 2

**[4] Choose the correct answer:**

① the circumference of the circle =  $\dots\dots\dots$

- (a)  $2\pi r$                       (b)  $\pi r$                       (c)  $\frac{1}{2}\pi r$                       (d)  $2\pi d$



②  $\frac{21-21}{16-4 \times 3} = \dots\dots\dots$

- (a) 0                      (b) 1                      (c) 21                      (d) meaningless

③ if three times a number is added to 15, then the expression that expresses this is  $\dots\dots\dots$

- (a)  $\chi + 15$                       (b)  $\chi - 15$                       (c)  $3\chi - 15$                       (d)  $3\chi + 15$

④ What is the missing number?

1, 1, 2, 3, 5, 8,  $\dots\dots\dots$

- (a) 11                      (b) 12                      (c) 13                      (d) 15

# Mathematics

## [5] Choose the correct answer:

①  $3 \times (2 + \dots) = 24$

- (a) 2                      (b) 3                      (c) 6                      (d) 8

② the area of a square is  $72 \text{ cm}^2$ , then the length of its diagonal = .....cm

- (a) 144                      (b) 12                      (c) 6                      (d) 10

③ The multiplicative identity element in  $\mathbb{N}$  is....

- (a) 0                      (b) 1                      (c) 2                      (d) 3

④ If E is the set of even numbers, then  $E \dots \mathbb{N}$

- (a)  $\in$                       (b)  $\notin$                       (c)  $\subset$                       (d)  $\not\subset$



## [6] Choose the correct answer:

①  $0.3 \dots \mathbb{N}$

- (a)  $\in$                       (b)  $\notin$                       (c)  $\subset$                       (d)  $\not\subset$

②  $(9 \times 4) \times 3 = \dots \times (4 \times 3)$

- (a) 3                      (b) 4                      (c) 9                      (d) 12

③ If  $2\chi = 6$ , then  $\chi = \dots$

- (a) 4                      (b) 2                      (c) 6                      (d) 3

④ The tenth term in the sequence :

1, 3, 6, 10, 15, ..... is.....

- (a) 36                      (b) 28                      (c) 55                      (d) 45

⑤ The circumference of the circle whose radius 7 cm equals ..... cm

- (a) 14                      (b) 22                      (c) 44                      (d) 66



### [1] Complete the following:

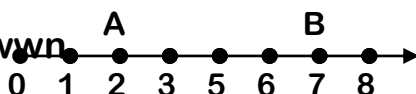
1) If  $a \in \mathbb{N}$  and  $b \in \mathbb{N}$ , then  $a + b \dots \mathbb{N}$

2)  $23 \times (88 + \dots) = 23 \times 100$

3) If  $x \in \mathbb{N}$ ,  $x + 5 = 5$ , then  $x = \dots$

4) If  $A(2, 5), B(4, 5)$ , then the midpoint of  $\overline{AB}$  is the point C (....., .....)

5) the distance between two points A and B is..... units



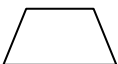
### [2] Complete the following:

a) The area of a rhombus =  $L \times \dots$

b)  $(12 \times \dots) \times k = 12 \times (h \times \dots)$

c) 2, 8, 32, ..... (in the same pattern)

d) The perimeter of a rectangle =  $2 \times (L + \dots)$

e) The figure  is called .....

\*\*\*\*\*

### [3] Complete the following:

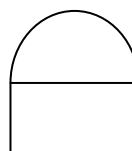
a)  $8 - 80$  is ..... in  $\mathbb{N}$

b) If  $2x = 40$ , then  $x = \dots$

c)  $53 \times 164 + 47 \times \dots = 164 \times 100$

d) the perimeter of the opposite

Figure = ..... cm ( $\pi = \frac{22}{7}$ )





## ***Different problems***

a) *Use the commutative and associative properties in  $N$  to find the value of:*

a)  $772 + 399 + 228 + 601$

.....

.....

.....

b)  $125 \times 25 \times 8 \times 4$

.....

.....

.....

c)  $25 \times 943 \times 4$

.....

.....

.....

d)  $247 + 612 + 253 + 388$

.....

.....

.....

e)  $16 \times 217 \times 125$

.....

.....

.....

f)  $572+324+176+447+428+253$

.....

.....

.....



---

***b) Solve the following equations:***

a)  $5\chi + 4 = 14$  , for the replacement set  $\{1, 2, 3\}$

.....

.....

.....

b)  $n \div 6 = 9$

.....

.....

c)  $98 - h = 21$  , for the replacement set  $\{66, 77, 88\}$

.....

.....

.....

d)  $2\chi + 1 = 11$  , for the replacement set  $\{6, 5, 4\}$

.....

.....

.....

.....

e)  $\chi + 3 = 21$

.....

.....

.....

f)  $2\chi - 1 = 7$  , for the replacement set  $\{3, 5, 4\}$

.....

.....

.....





g)  $5\chi + 4 = 14$  , for the replacement set  $\{1,2,3\}$

.....

.....

.....

h)  $\chi - 13 = 26$

.....

.....

.....

i)  $2\chi + 1 = 13$  , for the replacement set  $\{6,5,7\}$

.....

.....

.....

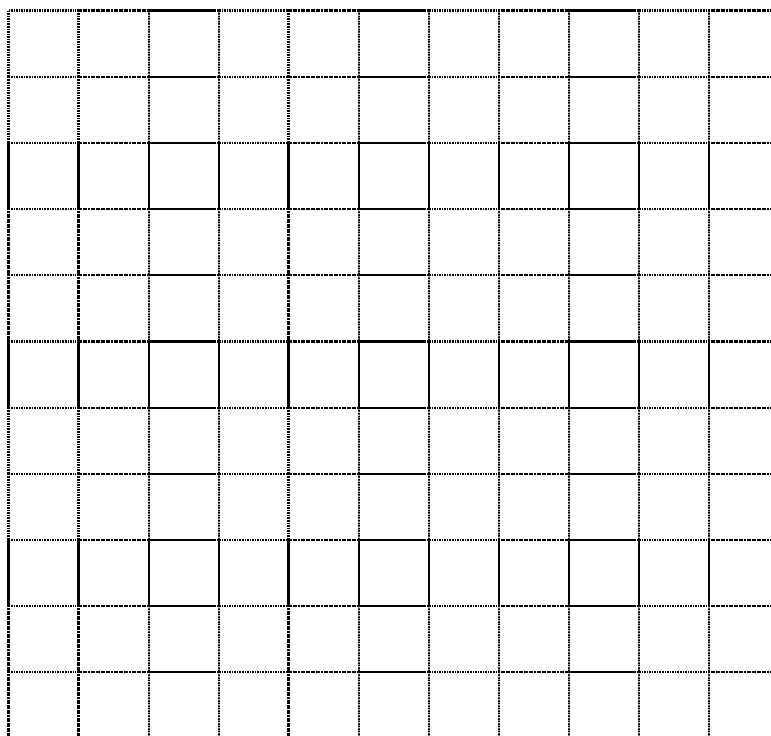
j)  $\frac{x}{3} = 6$

.....

.....

c) In the coordinate plane:

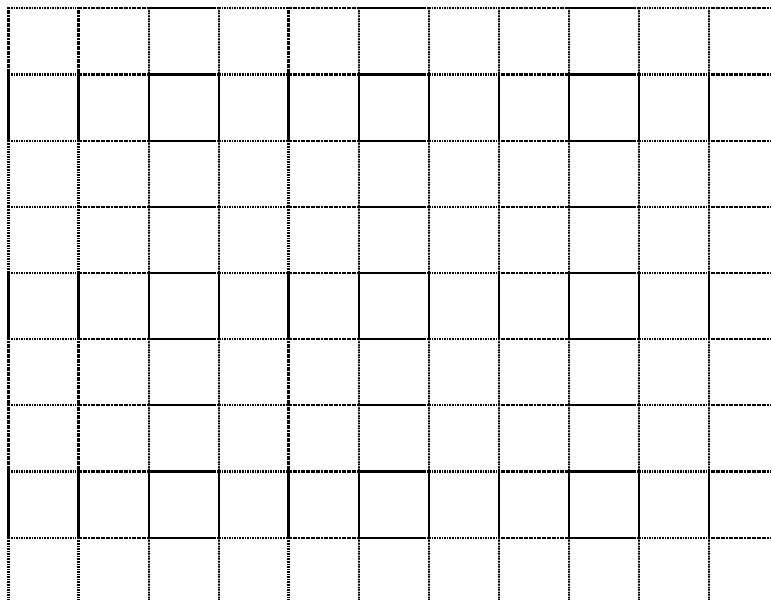
a) Draw the triangle ABC where A(2,1) , B ( 5,1) and C(5 , 5 ) ,then draw the image of triangle ABC by reflection in  $\overleftrightarrow{BC}$





b) Draw the triangle ABC where A(4,5) , B ( 2,0) and C(4 , 1 ) ,then

draw the image of triangle ABC by reflection in  $\overleftrightarrow{AC}$



d) The length of the diagonals of a rhombus are 12cm ,16cm and its height is 9.6 cm . find its side length

**Solution**

.....

.....

.....

.....

.....

e) If the area of an equilateral triangle 43.3 cm<sup>2</sup> and its height 8.66cm  
Calculate its perimeter .

**Solution**

.....

.....

.....

.....

.....