

Primary  
Exercises **6** 2014

***SECOND TERM***

# Unit 1



*Integers*

# Exercises 1

In the Venn diagram,  $U$  is the universal set.

$U =$  .....

$M =$  .....

$N =$  .....

$M^c =$  .....

$N^c =$  .....

$M \cup N =$  .....

$M - N =$  .....

$U - N =$  .....

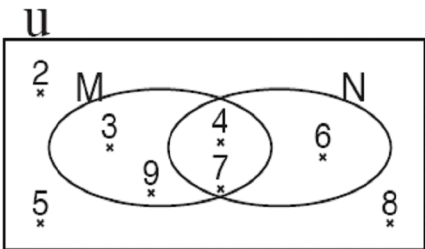
$M - U =$  .....

$M \cap N =$  .....

$N - M =$  .....

$N - U =$  .....

$U - M =$  .....



In the Venn diagram,  $U$  is the universal set.

$U =$  .....

$X =$  .....

$Y =$  .....

$Z =$  .....

$X^c =$  .....

$Y^c =$  .....  $Z^c =$  .....

$X \cup Y =$  .....

$X \cap Y =$  .....

$X \cup Z =$  .....

$X \cap Z =$  .....

$Z \cup Y =$  .....

$Z \cap Y =$  .....

$X - Y =$  .....

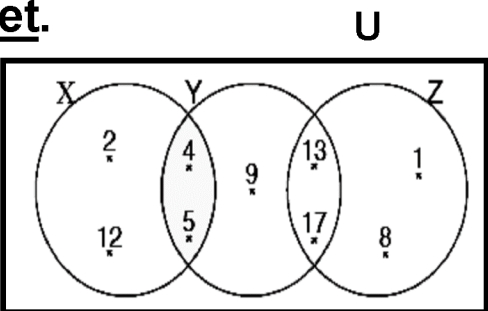
$Y - X =$  .....

$X - Z =$  .....

$X - Z =$  .....

$Z - Y =$  .....

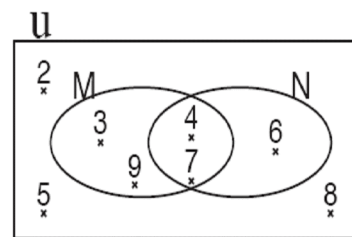
$Y - Z =$  .....



**Complete using (  $\in, \notin, \subset, \not\subset$  )**

5	.....	M
8	.....	N
{ 2 , 5 }	.....	M
{ 3 , 5 }	.....	N
N	.....	N
U	.....	U
7	.....	M
7	.....	N

3	.....	M
6	.....	N
{ 3 , 4 }	.....	M
{ 4 , 7 }	.....	N
M	.....	N
N	.....	U
U	.....	N
U	.....	M



{ 2 , 3 }	.....	M
{ 6 , 8 }	.....	N
M	.....	U

**Complete using (  $\in, \notin, \subset, \not\subset$  )**

5	....	{ 5 , 4 }
4	....	{ 54 }
9	....	{ 4 , 5 , 9 }
7	....	{ 37 , 73 }
2	....	{ 22 , 32 }
0	....	{ 10,50,20 }
1	....	{ 1 , 2 , 3 }

{ 5 , 4 }	.....	{ 5 , 4 }
{ 3 , 7 }	.....	{ 6 , 4 }
{ }	.....	{ 65,45 }
$\emptyset$	.....	{ 6 , 2 }
{ 1 , 2 }	.....	{ 12 , 21 }
{ 2 , 4 }	.....	{ 2 , 3 , 4 }
{ 2 , 3 , 4 }	.....	{ 2 , 4 }

{ 1 , 2 }	.....	{ 1 , 2 }
{ 2 , 3 }	.....	{ 1,2,3 }
{ 2 }	.....	{ 2 , 3 , 4 }
2	.....	{ 2 , 3 , 4 }
12	.....	{ 1 , 2 }
12	.....	{ 12 , 21 }
0	.....	{ }

**Find the value of ( x ) in each of the following :**

5	$\in$	{ 3 , 4 , x }	Then x = .....
x	$\notin$	{ 3 , 4 , 5 , ... }	Then x = .....
9	$\notin$	{ 1 , 2 , 3 , 4 }	Then x = .....
{ 4 , 5 }	$\subset$	{ 2 , 3 , 4 , x }	Then x = .....
{ 3 , x , 5 }	$\subset$	{ 5 , 3 , 4 }	Then x = .....
{ 1 , 2 , 3 }	$\not\subset$	{ 3 , 2 , 4 , x }	Then x = .....



## Exercises 2

**Write an integer to express each situation of the following :**

- 1) Hany gained LE 76 from his saving account. (.....)
- 2) Hany withdrew LE 76 from his saving account. (.....)
- 3) The temperature of Moscow City is 8 degrees below Zero. (.....)
- 4) The temperature of Moscow City is 10 degrees above Zero. (.....)
- 5) Building a public garage consists four floors underground. (.....)
- 6) Building a public garage consists 2 floors underground. (.....)
- 7) Paris rises 6 metres above sea level. (.....)
- 8) A Submarine at a depth of 90 metres below sea level (.....)
- 9) Ahmed withdrew 6000 pounds from his bank account. (.....)
- 10) The school added 10 marks for the student (Sarah), for her excellence in artistic activity. (.....)

**Complete the following**

- |                                   |  |
|-----------------------------------|--|
| (a) $ -12  = \dots\dots$          | (b) $- -105  = \dots\dots$                       |
| (c) $1-5+1+5 = \dots\dots$        | (d) $-1-10 = \dots\dots$                         |
| (e) $ 5  +  -7  = \dots\dots$     | (f) the relation between $ b $ , $ -b $ is ..... |
| (g) $1-5+1+5 = \dots\dots$        | (h) $-1-25 = \dots\dots$                         |
| (c) $1-5 \times 1+5 = \dots\dots$ | (d) $-12 = \dots\dots$                           |

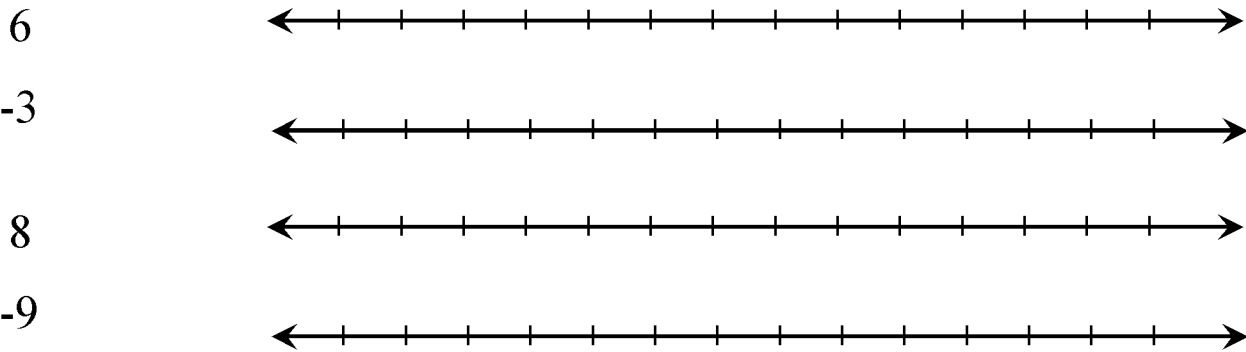
**Express each of the following sets using the listing method:**

- |  |             |
|--|-------------|
| (a) The set of integers which are less than 3                      | A = {.....} |
| (b) The set of integers which are less than 0                      | B = {.....} |
| (c) The set of integers which are less than -5                     | C = {.....} |
| (d) The set of integers which are less than -1                     | D = {.....} |
| (e) The set of integers which are greater than -5.                 | E = {.....} |
| (f) The set of integers between -4 and 4                           | F = {.....} |
| (g) The set of integers between -8 and 1                           | G = {.....} |
| (h) The set of integers which are greater than -2.                 | H = {.....} |
| (i) The set of integers which are less than 6 and greater than -2. | I = {.....} |
| (j) The set of integers which are less than 3 and greater than -3  | J = {.....} |
| (k) The set of non - positive even integers.                       | K = {.....} |

**Complete the following using one of the words (positive - negative - Zero) :**

- (a) Moving forward is represented by ..... numbers, while. moving backward is represented by ..... numbers.
- (b) Moving to the right is represented by ..... numbers, while moving to the left is represented by ..... numbers.
- (c) Lowering than sea level is represented by ..... numbers, Height above sea level is represented by ..... numbers. Sea level is represented by the number .....

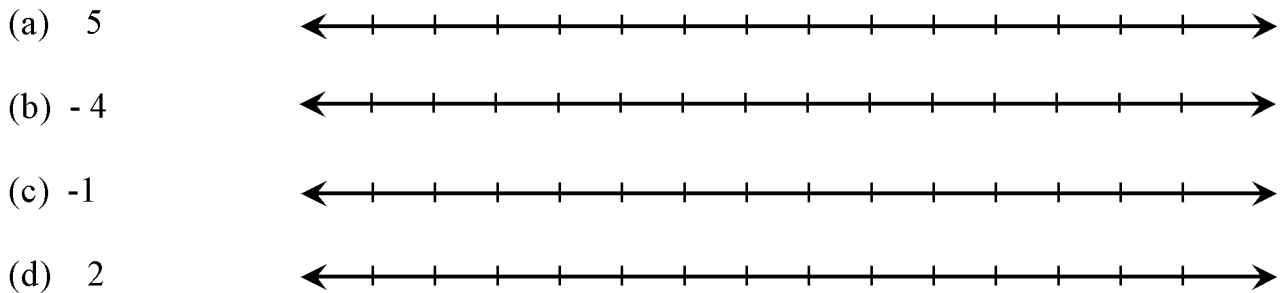
**Represent the following numbers on the number line using one of the symbols (x) or (•):**



**Write the inverse of each of the numbers :**

113 ( ..... )	-9 ( ..... )
0 ( ..... )	7 ( ..... )
13 ( ..... )	-45 ( ..... )
1 ( ..... )	-99 ( ..... )

**On the number line, colour each number of the following and its inverse :**



**Determine the value of the integer (b) in the following cases:**

- a)  $|b| = 7$  then .....
- b)  $|b| = 16$  then .....
- c)  $|-9| = b$  then .....
- d)  $|9| = b$  then .....

**Find the value of x to get a true statement :**

- (a)  $-5 \in \{-1, 0, -3, x\}$  then .....
- (b)  $-3 \in \{-2, 1, -1, x\}$  then .....
- (c)  $x \in \{-2, 3, 4, 5\} \cap \{-2, -3, -4\}$  then .....
- (d)  $x \in \{2, 5, -3\} \cap \{5, -2, -3\}$  then .....
- (e)  $\{5, x\} \cup \{-4, 0, 4\} = \{0, -4, 3, -5, 5\}$  then .....
- (f)  $\{2, x\} \cup \{-4, 0, 4\} = \{0, -2, 2, -4, 4\}$  then .....

### **Mark (true) or (false) and give the reason :**

- (a)  $Zero \in Z^-$  ( ) because : .....  
(b)  $Zero \in Z^+$  ( ) because : .....  
(b)  $\varnothing = Z^- \cap Z$  ( ) because : .....  
(b)  $\varnothing = Z^- \cap Z^+$  ( ) because : .....  
(c)  $Z^+ \cap N = Z^+$  ( ) because : .....  
(c)  $Z \cap Z^+ = N$  ( ) because : .....  
(d)  $\{-17\} \subset Z$  ( ) because : .....

## **Exercises 3**

### **Arrange the following integers :**

- (a) 6 , -60 , 2 , -17 , -22 , 0 (ascendingly).  
..... , ..... , ..... , ..... , ..... , .....

- (a) 5 , -15 , 15 , -7 , -21 , 8 (ascendingly).  
..... , ..... , ..... , ..... , ..... , .....

- (b) 1 , -11 , 3 , -1 , -8 , 5 (descendingly).  
..... , ..... , ..... , ..... , ..... , .....

- (b) 9 , -6 , 0 , 1 , -15 , 40 (descendingly).  
..... , ..... , ..... , ..... , ..... , .....

### **Complete the space using the correct sign (>, < or =) :**

- (a)  $3 \dots -6$  (b)  $-7 \dots 17$  (c)  $-13 \mid \dots 3$   
(d)  $-5 \mid \dots 5$  (e)  $3 + \mid -3 \mid \dots 8$  (f)  $- \mid -4 \mid \dots 2$   
(g)  $8 \dots -9$  (h)  $-88 \dots 28$  (i)  $-13 \mid \dots 3$   
(j)  $- \mid -7 \mid \dots 7$  (k)  $8 + \mid -2 \mid \dots 6$  (l)  $- \mid -3 \mid \dots -8$

### **Write the previous integer and the next integer for each of the following integers :**

- (a) ( ..... ), -9 , ( ..... ) (b) ( ..... ), 13 , ( ..... )  
(c) ( ..... ), 23 , ( ..... ) (d) ( ..... ), Zero , ( ..... )  
(e) ( ..... ), 9 , ( ..... ) (f) ( ..... ), -13 , ( ..... )  
(c) ( ..... ), -23 ( ..... ) (d) ( ..... ), -5 , ( ..... )

### **Write the integers between each two integers of the following:**

- (a) -4, ( ..... ), 2 (b) -1, ( ..... ), 1 (c) -7, ( ..... ), -6  
(a) -2, ( ..... ), 0 (b) -1, ( ..... ), 5 (c) -3, ( ..... ), 0

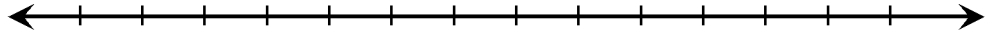
### **Determine the Constant value by which the following integers increase, then complete the next three numbers :**

- (a) -7, -6, -5, ....., ....., .....  
(b) -2, 0, 2, 4, ....., ....., .....  
(c) -50, -40, -30, ....., ....., .....

## Exercises 4

1- Use the number line to represent the following operations of addition and subtraction :

(a)  $3 + 4 = \dots\dots$



(b)  $(-2) + (-4) = \dots\dots$



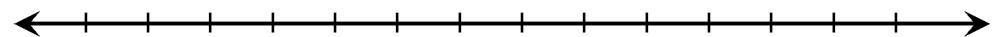
(c)  $6 - (-3) = \dots\dots$



(e)  $-2 - 3 = \dots\dots$



(f)  $-5 + 7 = \dots\dots$



(g)  $-8 + 3 = \dots\dots$



(h)  $2 - 6 = \dots\dots$



(i)  $8 - 3 = \dots\dots$



(j)  $5 - 5 = \dots\dots$



(k)  $3 - (-3) = \dots\dots$



(l)  $0 + (-3) = \dots\dots$



**2- Write the integers representing in each of the following :**

(a)  $x < -1$

.....

(b)  $x > -1$

.....

(c)  $x > 7$

.....

(d)  $x < 7$

.....

(e)  $-4 < x < 4$

.....

(f)  $-2 < x < 3$

.....

(g)  $x < 0$

.....

(h)  $x > 0$

.....

**3- Complete using the suitable sign (  $\in$ ,  $\notin$ ,  $\subset$ ,  $\supset$  ):**

(a)  $1-9 \mid 1+3$  ..... Z

(b)  $\{9\}$  ..... Z

(c)  $\{-3, 7, 11\}$  ..... Z

(d)  $\frac{9}{(7+7)}$  ..... Z

(e)  $\frac{(6-6)}{8}$  ..... Z

(f)  $\frac{3}{5}$  ..... Z

(a)  $1-9 \mid 1+1-3 \mid 1$  ..... Z

(b)  $\{-1, 0, 9\}$  ..... Z

(c)  $\{-3\}$  ..... Z

(d)  $\frac{9}{(7-7)}$  ..... Z

(e)  $\frac{(9-1)}{8}$  ..... Z

(f)  $\frac{3}{5} \{5, \frac{3}{5}\}$  ..... Z

**4- Use the properties of addition operation in Z to find the result of the following :**

(a)  $-120 + 17 + 131$

.....

.....

.....

.....

.....

.....

.....

.....

.....

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.....

.....

.....

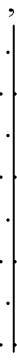
.....

.....

A dot plot showing the distribution of  $X$  and  $Y$ . The horizontal axis is labeled  $X = \{-1, 0, 1\}$  and the vertical axis is labeled  $Y = \{-2, -1, 0, 1, 2\}$ . The plot shows a vertical line at  $X=0$  with dots at  $Y=-2, -1, 0, 1, 2$ . There are also dots at  $X=-1, Y=-1$  and  $X=1, Y=1$ .

$$X = \{ -2, 0, 2 \}$$

$$Y = \{ -3, 0, 1, 2, 3 \}$$



6- Ramy deposited a sum of money amounting to LE 6220, then he withdrew an amount of LE 1211, and then deposited an another amount of LE 2110.  
How much is the balance of Ramy in the bank?

7- Ramy deposited a sum of money amounting to LE 520, then he withdrew an amount of LE 111, and then deposited an another amount of LE 2130.  
How much is the balance of Ramy in the bank?

8- A Submarine at a depth of 90 metres below sea level, rose 60 metres.  
Use the appropriate calculation to calculate the new depth of the submarine.

9- A Submarine at a depth of 85 metres below sea level, rose 43 metres.  
Use the appropriate calculation to calculate the new depth of the submarine.

10- Temperature is recorded in st. Catherine  $-3^{\circ}\text{C}$  at three o'clock after midnight, while it is recorded  $11^{\circ}\text{C}$  in the afternoon.  
calculate the increase in temperature

## Exercises 5

**1- Find the result of each of the following :**

(a)  $8 \times 8 = \dots\dots\dots$

(b)  $-5 \times (-4) = \dots\dots\dots$

(c)  $-8 \times 1 = \dots\dots\dots$

(d)  $-9 \times (7) = \dots\dots\dots$

(e)  $0 \times (-11) = \dots\dots\dots$

(f)  $-(-6) \times (-2) = \dots\dots\dots$

(g)  $-5 \times 4 = \dots\dots\dots$

(h)  $6 \times (-2) = \dots\dots\dots$

(i)  $-(-5) \times -4 = \dots\dots\dots$

(j)  $5 \times 4 = \dots\dots\dots$

(k)  $1-31 \times (-4) = \dots\dots\dots$

(1)  $-1-31 \times 4 = \dots\dots\dots$

(m)  $(-3) \times -13 = \dots\dots\dots$

(n)  $3 \times 3 = \dots\dots\dots$

**2- Determine the possible division operation in  $\mathbb{Z}$  of each of the following :**

(a)  $(-32) \div 8 = \dots\dots\dots$

(b)  $65 \div (-13) = \dots\dots\dots$

(c)  $420 \div (-15) = \dots\dots\dots$

(d)  $(-1300) \div 26 = \dots\dots\dots$

**3- Find the result of each of the following in two ways :**

(a)  $(-4) \times [4 + (-1)]$

This image shows a blank sheet of primary-ruled paper. It features ten horizontal dotted lines spaced evenly across the page. A single vertical solid line runs down the center, acting as a midline. This layout is commonly used for teaching handwriting to young children, where the dotted lines define the height of letters and the solid line indicates the starting point for writing.

(b)  $[5 + (-3)] \times (-11)$

This image shows a blank sheet of primary-ruled paper. It features ten horizontal dotted lines spaced evenly apart. A single vertical solid line runs down the center of the page, acting as a midline. The paper is otherwise empty, with no handwriting or other markings.



(c)  $6 \times (-6 + 0)$

[illegible]

(d)  $(-2) \times [3 + (-5)]$

[illegible]

(e)  $[8 + (-2)] \times (-10)$

This image shows a blank sheet of primary-ruled paper. It features ten horizontal dotted lines spaced evenly apart. A single vertical solid line runs down the center of the page, acting as a midline. This layout is commonly used for teaching handwriting to young children, where the solid line defines the middle zone and the dotted lines define the top and bottom zones for letter formation.

(f)  $-6 \times [-6 + 0]$

[illegible]



**5- Find the value of x if :**

(a)  $8 \times x = -48$  .....

(b)  $5 \times x = -35$  .....

(c)  $x \times 5 = -45$  .....

(d)  $x \times -6 = -96$  .....

(e)  $x \times (5 \times -13) = (-9 \times 5) \times -13$   
.....

(f)  $6 \times (x \times -8) = (-6 \times -7) \times -8$   
.....

**Exercises 6**

**1- Find the value of each of the following :**

(a)  $(-7)^2 =$  .....

(c)  $(-6)^2 =$  .....

(e)  $(-2)^4 + (-3)^3 =$  .....

(g)  $(2)^3 + (-3)^2 =$  .....

(i)  $(-4)^3 \times (-1)^5 =$  .....

(k)  $(-2)^3 \times (-1)^6 =$  .....

(b)  $(-5)^2 \times 2^2 =$  .....

(d)  $(-3)^2 \times 3^2 =$  .....

(f)  $(-1)^{100} + (-1)^{101} =$  .....

(h)  $(1)^{100} + (-1)^{200} =$  .....

(j)  $2^3 + 2^2 =$  .....

(l)  $6^2 + (-2)^3 =$  .....

**2- Find the result of each of the following :**

(a)  $3^7 \div 3^4 =$  .....

(c)  $5^5 \div 5^3 =$  .....

(e)  $8^6 \div 8^5 =$  .....

(g)  $2^9 \div 2^6 =$  .....

(i)  $9^7 \div 9^6 =$  .....

(k)  $5^3 \div 5^3 =$  .....

(b)  $(-6)^5 \div (-6)^3 =$  .....

(d)  $(-8)^4 \div (-8)^3 =$  .....

(f)  $(-9)^6 \div (-9)^4 =$  .....

(h)  $(-5)^6 \div (-5)^3 =$  .....

(j)  $(-2)^7 \div (-2)^4 =$  .....

(l)  $(-3)^4 \div (-3)^4 =$  .....

**3 -Arrange in an ascending order:**

$$3^2, (-1)^{15}, (-4)^0, (-3)^2, (-2)^5$$

..... , ..... , ..... , ..... , .....

$$5^2, 1^{15}, (-8)^0, (-4)^2, (-3)^3$$

..... , ..... , ..... , ..... , .....

$$6^2, (-8)^0, (-4)^2, (-8)^2, (-1)^5$$

..... , ..... , ..... , ..... , .....

**4- Find the result of each case of the following :**

(a)  $\frac{2^5 \times 2^6}{2^3 \times 2}$  .....  
.....

(b)  $\frac{(-3)^3 \times (-3)^4}{(-3)^5}$  .....  
.....

(c)  $\frac{(-8)^3 \times 8^4}{(-8)^5}$  .....  
.....

(d)  $\frac{9^6 \times (-9)^6}{(-9)^5 \times 9^2}$  .....

(e)  $\frac{5^5 \times (-5)^3}{(-5)^6 \times 5}$  .....

.....

.....

.....

(a)  $3a^2$

**(b)  $2a + 3b$**

(c)  $\mathbf{a}^2 + \mathbf{b}^2 + \mathbf{ab}$

[illegible]

**5- If  $x = 3$  ,  $y = -2$ , find the value of the following :**

**(a)  $5x^2$**

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

**(b)  $2y + 3x$**

**(c)  $x^2 + 2xy + y^2$**

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

**6- Arrange in a descending order :**

$10^2$  ,  $(-1)^5$  ,  $100^2$  ,  $(-10)^3$  , 1000000

..... , ..... , ..... , ..... , .....

$10^3$  ,  $(-1)^6$  , 1 000 000 ,  $(-100)^3$  ,  $(-10)^5$

..... , ..... , ..... , ..... , .....

$6^2$  ,  $(-9)^0$  ,  $(-4)^2$  ,  $(-8)^2$  ,  $(-1)^6$

..... , ..... , ..... , ..... , .....

**7- Put the suitable sign ( > , < or = ) :**

(a)  $3^2$  .....  $2^3$

(b)  $(-7)^2$  ..... 14

(c)  $(9)^2$  .....  $(-3)^4$

(d)  $(-5)^2$  ..... -25

(e)  $(-6)^2$  ..... - 12

(f)  $(-8)^2$  .....  $(-4)^3$

(g)  $9^2$  .....  $2^3$

(h)  $(-8)^2$  .....  $(-2)^5$

(i)  $5^3$  .....  $(-5)^3$

(j)  $(-3)^4$  .....  $3^4$

## Exercises 7

**1- Complete the following table :**

<i>The numerical pattern</i>	<i>Description of the pattern</i>
2 , 7 , 12 , 17 , 22 , 27 , .....	.....
.....	Each number is more than its predecessor by 3.
$\frac{1}{2}$ , 1 , $1\frac{1}{2}$ , 2 , .....	.....
.....	Each number is less than its predecessor by 5.
2 , 4 , 8 , 16 , 32 , .....	.....
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 , ..... , ..... , .....

(e) 3 , 10 , 17 , 24 , 31 , ..... , ..... , .....

(f) 2 , 4 , 8 , 16 , 32 , ..... , ..... , .....

(g) 1 , 8 , 27 , 64 , ..... , ..... , .....

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

(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 , ..... , .....

(f) 5 , 7 , ..... , 11 , 12 , ..... , .....

(g) 8 , ..... , 16 , 20 , 24 , ..... , .....

(h) 0.8 , 1.6 , ..... , 2.4 , 3.2 , ..... , .....

(i) 729 , 243 , ..... , 81 , 27 , ..... , .....

(j) ..... , 20 , 15 , 10 , ..... , .....

4- An Egyptian land company reclaims 6 feddans per day to become prepared and ready for agriculture. How many days do the company require to reclaim about 50 feddans ? Write the numerical pattern which expresses this and describe it.

.....

5 - Ahmed saves LE 5 per week . How many weeks Ahmed needs to save LE 30 ?

Write the numerical pattern which expresses this and describe it.

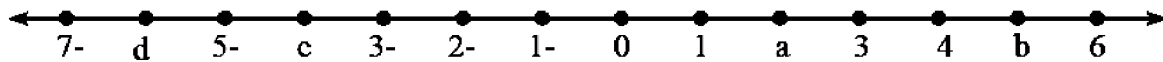
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.....



## Exercises 8

1- Write the integers at the points a, b, c, d on the number line :



2- Find the absolute value of the following integers :

-321 , 78 , -56 , -10 , 0 , 21

3- Complete the following :

- |   |                                      |
|---|--------------------------------------|
| (a) $Z \cap N = \dots\dots\dots$                                  | (b) $Z^+ \cap Z^- = \dots\dots\dots$ |
| (c) $Z - N = \dots\dots\dots$                                     | (d) $Z - Z^- = \dots\dots\dots$      |
| (e) $Z^+ \cup \{0\} = \dots\dots\dots$                            | (f) $- -45  = \dots\dots\dots$       |
| (g) the complement of $Z^-$ with respect to $Z = \dots\dots\dots$ |                                      |
| (h) the complement of $Z^-$ with respect to $Z = \dots\dots\dots$ |                                      |
| (i) the complement of $N$ with respect to $Z = \dots\dots\dots$   |                                      |
| (j) $N \cup Z^- = \dots\dots\dots$                                |                                      |

4- Write the nearest integer to make the following statements true :

- |                            |                              |                              |
|----------------------------|------------------------------|------------------------------|
| (a) $-4 > \dots\dots\dots$ | (b) $2 < \dots\dots\dots$    | (c) zero $> \dots\dots\dots$ |
| (d) $-6 < \dots\dots\dots$ | (e) $ -6  > \dots\dots\dots$ | (f) zero $< \dots\dots\dots$ |

5- Complete in the same pattern :

- (a) -20 , -18 , -16 ,  $\dots\dots\dots$  ,  $\dots\dots\dots$  ,  $\dots\dots\dots$
- (b) -15 , -10 , -5 ,  $\dots\dots\dots$  ,  $\dots\dots\dots$  ,  $\dots\dots\dots$
- (c) -4 , 0 , 4 ,  $\dots\dots\dots$  ,  $\dots\dots\dots$  ,  $\dots\dots\dots$

6- Arrange the following numbers in an ascending order :

- (a) -9 , 17 ,  $|-9|$  , -15 , 16
- (b) 3 , -30 ,  $-|8|$  , 0 , 11

7- Express each of the following sets using the listing method :

- (a) the set of negative integers.
- (b) the set of odd integers.
- (c) the set of negative even integers.
- (d) the set of integers between -3 and 13.

8- Find the result of each of the following :

- (a)  $-12 + 7$                       (b)  $19 - (-11)$                       (c)  $-77 + (-3 + 77)$

9- Find the result of each of the following :

(a)  $-2 + 8$

(b)  $-5 + 5$

(c)  $-5 + (-2)$

10- Complete to find the result of the following and state the property used in each step :

$$\begin{aligned}
 116 + 190 + (-116) &= 116 + (\dots + -116) && (\dots \text{ Property}) \\
 &= 116 + (\dots + 190) && (\dots \text{ Property}) \\
 &= (116 + \dots) + 190 && (\dots \text{ Property}) \\
 &= \dots + 190 && (\dots \text{ Property}) \\
 &= 190
 \end{aligned}$$

11- Check the property of closure of the addition and subtraction on the following set :

$$X = \{-5, 8, 6, -2\}$$

12- Find the result of each of the following in two ways :

(a)  $(-6) \times [(-3) + 2]$

(b)  $[7 + (-4)] \times 9$

13- (a) find the value of m if :  $-7 \times m = 42$

(b) find the value of :  $x - 2y + 4$  if :  $x = 8$  ,  $y = -2$

14- find the value of each of the following :

(a)  $(-4)^2 \times 3^3$

(b)  $(-1)^{30} + (-1)^{13}$

(c)  $(-5)^3 \times (-1)^{17}$

(d)  $2^{11} \div 2^8$

(e)  $(-4)^9 \div (-4)^7$

(f)  $(-3)^7 \div 3^4$

15- Complete the following table :

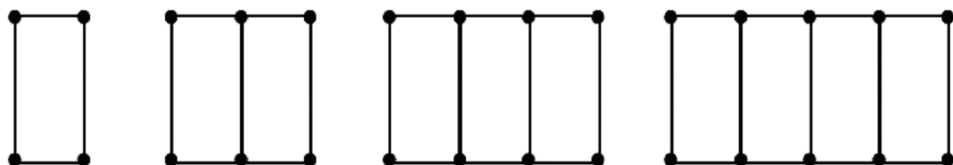
The numerical pattern	Description of the pattern
75 , 70 , 65 , 60 , 55 , .....	.....
.....	Each number is less than its predecessor by 4
1 , 10 , 100 , 1000 , .....	.....
.....	Each number is twice its predecessor

16- Find the result of each of the following :

$$(a) \frac{(-5)^3 \times (-5)^2}{(-5)^4}$$

$$(b) \frac{(2)^5 \times (-2)^3}{(-2) \times 2^4}$$

17- Deduce the pattern rule expressing the following design, then write the numerical pattern :



Number of line segments : .....      .....      .....      .....

The numerical pattern : .....

The pattern rule: .....

18- Sheriff saves LE 51 every month. How many months does he need to save about LE 160?

Write the numerical pattern which expresses this and describe it.

# Unit 2



*The equations*  
*And*  
*The inequalities*

## Exercise 1

## The equation and inequality of first degree

Determine which of the following represents an equation or an inequality and give reasons :

- a**  $2x + 1 = 5$  ( )     **b**  $3x + 2 = 11$  ( )     **c**  $2x > 9$  ( )  
**d**  $x = 7 + 2$  ( )     **e**  $x > 7 - 5$  ( )     **f**  $x < -25$  ( )  
**g**  $2x = 24$  ( )     **h**  $2y + 3 \leq 5$  ( )     **i**  $5x \geq 30$  ( )

Determine the degree of each of the following :

- a**  $x - 7 = 1$  ( )     **b**  $4b - 3 = 5$  ( )     **c**  $3x - 9 = 2$  ( )  
**d**  $3x^2 - 6 = 14$  ( )     **e**  $3x^3 + x + 4 = 0$  ( )     **f**  $5x + 2 > 7$  ( )  
**g**  $x - 2y = 5$  ( )     **h**  $3x - 2 < -2$  ( )     **i**  $3x^4 - 5 \leq 7$  ( )

Find the solution set of each of the following equations :

- a**  $x + 7 = 10$  if the substitution set is  $\{1, 3, 5\}$

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- b**  $2x + 1 = 5$  if the substitution set is  $\{-1, -2, 0, 2\}$

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**c**  $3x - 4 = 8$  if the substitution set is  $\{3, 5, 6\}$

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**d**  $-2 + 3x = 7$  if the substitution set is  $\{0, 1, 2\}$

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.....

**e**  $3x + 7 = 4$  if the substitution set is  $\{0, 1, 2, 5\}$

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**4** Find the solution set of each of the following inequalities :

**a**  $x + 3 < 5$  if the substitution set is  $\{4, 3, 2, 1, 0\}$

.....

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**b**  $3x - 1 > -2$  if the substitution set is  $\{-2, -1, 0, 1, 2\}$

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**e**  $3x + 4 \leq -2$  if the substitution set is  $\{-1, 0, 1, 2, 3\}$

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**f**  $-x + 1 < 4$  if the substitution set is  $\{-3, -2, 0, 2, 3\}$

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**Choose the correct answer from those given :**

- a**  Which of the following represents an equation ?  
 [a]  $x - 17$       [b]  $22 - 7 = 15$       [c]  $x > -11$       [d]  $2x + 3 = 7$
- b**  The equation  $x^2 + 3 = 4$  is of ..... degree.  
 [a] first      [b] second      [c] third      [d] fourth
- c** Which of the following numbers represents a solution to the equation  $x + 3 = 7$ , where the substitution set is  $\{0, 1, 2, 3, 4, 5\}$  ?  
 [a] 6      [b] 4      [c] 3      [d] 2
- d** If the substitution set is  $\{3, 5, 7, 9\}$ , which of the following numbers is a solution to the equation  $3x + 6 = x + 20$  ?  
 [a] 3      [b] 5      [c] 7      [d] 9
- e** The number  $-5$  is a solution to the equation ..... where the substitution set is  $\mathbb{Z}$   
 [a]  $x - 3 = 2$       [b]  $2x - 1 = 9$   
 [c]  $-2x + 3 = 13$       [d]  $x + 3 = 2x + 12$
- f** If 3 is a solution to the equation :  $2x - 4 = a$ , then  $a =$  .....  
 [a] 3      [b] 2      [c]  $-2$       [d]  $-3$
- g** If the substitution set is  $\{2, -1, 3, 4\}$ , then the solution set of the equation :  $2x + 3 = 3$  is .....  
 [a]  $\{0\}$       [b]  $\{-1\}$       [c]  $\{3\}$       [d]  $\emptyset$



## Exercise 2

## Solving first degree equations in one unknown

Find the solution set of each of the following equations in  $\mathbb{N}$  :

**a**  $x + 3 = 7$

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**b**  $x + 11 = -2$

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**c**  $x - 9 = -5$

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**d**  $-4 + y = 13$

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**e**  $5x = 20$

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**f**  $\frac{n}{3} = 5$

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**g**  $2x - 1 = 5$

**h**  $8 - 2x = -2$

**i**  $\frac{x}{2} - 4 = 7$

**j**  $2y + 16 = 2^4$

**k**  $3x - 2 = -19$



Find the solution set of each of the following equations in  $\mathbb{Z}$  :

**a**  $x - 3 = -7$

.....

.....

.....

**b**  $x + 8 = 0$

.....

.....

.....

**c**  $n + 17 = |-13|$

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**d**  $m - (-3) = 1$

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**e**  $-4 + x = -8$

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**f**  $-4x = -24$

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**g**  $5y = -35$

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**g**

$8x + 12 = 4$

**h**

$3x - 13 = 26$

**i**

$3x - 2 = -19$

**j**

$\frac{y}{5} + 2 = -4$

**k**

$3x - 14 = |-16|$



Find the S.S. of each of the following equations :

$$2x + 3x + 25 = 5 \text{ where } x \in \mathbb{Z}$$

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$$3x + 2 = x + 18 \text{ where } x \in \mathbb{N}$$

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$$\frac{3x - 4}{5} = 7 \text{ where } x \in \mathbb{N}$$

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$$3(2x - 5) = 3(x + 20) \text{ where } x \in \mathbb{Z}$$

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**Complete :**

- a** If  $x + 5 = 7$  , then  $x = \dots\dots\dots$       **b** If  $4x = 20$  , then  $x = \dots\dots\dots$   
**c** If  $2x - 1 = 5$  , then  $x = \dots\dots\dots$       **d** If  $3y = 6$  , then  $5y = \dots\dots\dots$   
**e** If  $4x = 24$  , then  $\frac{x}{3} = \dots\dots\dots$       **f** If  $x + 9 = 11$  , then  $7x = \dots\dots\dots$   
**g** If  $2a + 3 = 15$  , then  $\frac{1}{3}a = \dots\dots\dots$       **h** If  $2x = 5$  , then  $4x = \dots\dots\dots$   
**i** The S.S. of the equation  $x - 5 = 2^4$  in  $\mathbb{Z}^-$  is  $\dots\dots\dots$   
**j** The S.S. of the equation  $x - 3 = (6)^0$  in  $\mathbb{Z}$  is  $\dots\dots\dots$

**Choose the correct answer from those given :**

- a**  If  $x + 2 = |-4|$  , then  $x = \dots\dots\dots$   
**[a]**  $-2$       **[b]**  $2$       **[c]**  $-6$       **[d]**  $6$   
**b**  The solution set for the equation  $2x - 1 = -5$  in  $\mathbb{Z}$  is  $\dots\dots\dots$   
**[a]**  $\{-3\}$       **[b]**  $\frac{-1}{2}$       **[c]**  $\{3\}$       **[d]**  $\{-2\}$   
**c**  If  $x + 3 = 5$  ,  $x \in \mathbb{Z}^-$  , then the solution set is  $\dots\dots\dots$   
**[a]**  $\{-3\}$       **[b]**  $\{5\}$       **[c]**  $\{-5\}$       **[d]**  $\emptyset$   
**d** If  $2x = 2$  , then  $3x - 1 = \dots\dots\dots$   
**[a]**  $2$       **[b]**  $3$       **[c]**  $4$       **[d]**  $5$   
**e** If  $2x = 0$  , then  $x = \dots\dots\dots$   
**[a]**  $2$       **[b]**  $3$       **[c]**  $5$       **[d]** zero  
**f** If  $2ab = 10$  , then  $3ab = \dots\dots\dots$   
**[a]**  $5$       **[b]**  $6$       **[c]**  $15$       **[d]**  $30$   
**g** If  $5x + 8x + 2x + 4x = 114$  , then  $5x + 3 = \dots\dots\dots$   
**[a]**  $33$       **[b]**  $35$       **[c]**  $47$       **[d]**  $8x$   
**h** The solution set of the equation :  $x + 3 = 12$  is equal to the solution set of the equation :  
**[a]**  $x - 3 = -12$       **[b]**  $x + (-3) = 12$   
**[c]**  $x - (-3) = 12$       **[d]**  $x - (-3) = -12$

**Exercise 3**

**Applications on solving first  
degree equations in  $\mathbb{Z}$**

An integer which we add to it 7 , the result will be 12 , find the number.

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If 9 is added to twice a number , the result is 55 , find the number.

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Two natural numbers , one of them is twice the other and their sum is 108 , find the two numbers.

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**The difference between two natural numbers is 5 and their sum is 21  
What are the two numbers ?**

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**Two consecutive integers whose sum is  $-27$  , find them.**

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**Find three consecutive even numbers if their sum is 966**

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**The sum of two integers is zero. The three times of the greater number equals the smaller number plus 32 , what are the two numbers ?**

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**The length of a rectangle is three times its width and its perimeter is 24 cm. , find its area.**

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**The age of a man now is three times the age of his son. After three years , the sum of ages of them will be 66 years. Find the age of each of them.**

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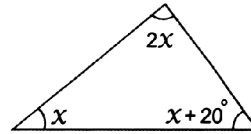
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Find the measure of each angle in the opposite triangle :



If the number of illiterate people in a village is 3200 and the number of females of them is three times the number of males. Calculate the number of both males and females.

A man wants to distribute 90 000 pounds among his sons (a girl and two boys). If the share of the boy is twice that of the girl, find the share of each of the boy and the girl.



Choose the correct answer from those given :

- a** Two consecutive natural numbers , the smaller one is  $x$  , then the geater one is .....
- [a]  $2x$                       [b]  $x + 1$                       [c]  $2x + 1$                       [d]  $x - 1$
- b** Two consecutive integers , the greater one is  $x - 1$  , then the smaller one is .....
- [a]  $x$                       [b]  $x - 2$                       [c]  $x + 2$                       [d]  $2x - 1$
- c** Two consecutive natural odd numbers , the smaller one is  $x$  , then the greater one is .....
- [a]  $x + 1$                       [b]  $x + 2$                       [c]  $x + 3$                       [d]  $3x$
- d** Two consecutive even numbers , the smaller one is  $x + 1$  , then the greater one is .....
- [a]  $x$                       [b]  $x + 2$                       [c]  $x + 3$                       [d]  $x + 4$
- e** If  $x$  is a natural odd number , then the next even number directly is .....
- [a]  $x + 1$                       [b]  $x - 1$                       [c]  $2x$                       [d]  $x^2$
- f** Two natural numbers , one of them is three times the other. If the smaller one is  $2x$  , then the greater one is .....
- [a]  $2x + 3$                       [b]  $3x$                       [c]  $5x$                       [d]  $6x$

The sum of the three dimensions of a cuboids is 18 cm. If the length of its base is three times its width and its height is twice its width, calculate the lengths of its dimensions.

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## Exercise 2 Solving first degree inequality in one unknown

Find the S.S. of each of the following inequalities , then represent the S.S. on the number line :

a  $x - 3 < 1$  where  $x \in \mathbb{N}$  .....

.....



b  $x + 2 > 5$  where  $x \in \mathbb{N}$  .....

.....



c  $19 < a + 14$  where  $a \in \mathbb{N}$  .....

.....



d  $4k \geq -16$  where  $k \in \mathbb{N}$  .....

.....



e  $3 < x + 2 \leq 6$  where  $x \in \mathbb{N}$  .....

.....



f  $1 - 3x > 7$  where  $x \in \mathbb{N}$  .....

.....



$$x - 4 > 1 \text{ where } x \in \mathbb{Z}$$



$$-2y < 14 \text{ where } y \in \mathbb{Z}$$



$$x + 6 \geq 3 \text{ where } x \in \mathbb{Z}$$



$$m + 7 \geq |-5| \text{ where } m \in \mathbb{Z}$$



$$9 - 6x < 15 \text{ where } x \in \mathbb{Z}$$



$$4x + 2 \geq -10 \text{ where } x \in \mathbb{Z}$$



$$3 < x + 2 \leq 6 \text{ where } x \in \mathbb{N}$$

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$$-5 \leq x + 3 < 6 \text{ where } x \in \mathbb{N}$$

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$$-3 \leq 1 + x < 3 \text{ where } x \in \mathbb{Z}$$

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$$1 < 5 - x \leq |-3| \text{ where } x \in \mathbb{Z}$$

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**Complete :**

- a** The S.S. of the inequality :  $4x < 8$  in  $\mathbb{N}$  is .....
- b** The S.S. of the inequality :  $0 \leq x - 1 < 3$  is .....
- c** If  $x > y$  , then  $x + Z$  .....  $y + Z$
- d** If  $x > y$  , then  $x - Z$  .....  $y - Z$
- e** If  $a - 3 < 0$  , then .....  $>$  .....
- f** If  $b < 0$  , then  $b + 3$  .....  $3$
- g** The S.S. of the inequality :  $-5 < -x \leq 2$  in  $(\mathbb{Z}^+)$  is .....
- h** The S.S. of the inequality :  $1 - x > 4$  in  $\mathbb{N}$  is .....
- i** If  $x > y$  and  $z$  is positive , then  $xz$  .....  $yz$
- j** If  $x < y$  and  $z$  is negative , then  $xz$  .....  $yz$
- k** The S.S. of the inequality :  $4x - 1 \geq 5$  in  $\mathbb{Z}$  is .....
- l** The S.S. of the inequality :  $-2 < 2x < 2$  in  $\mathbb{Z}$  is .....

**Choose the correct answer :**

- a**  The number that satisfies the inequality :  $x - 2 > 3$  is .....  
**[a]** 3                      **[b]** 4                      **[c]** 5                      **[d]** 6
- b**  The number which satisfies the inequality :  $x > -2$  is .....  
**[a]** -1                      **[b]** -4                      **[c]** -3                      **[d]** -2
- c** The S.S. of the inequality :  $2x + 1 \leq 5$  in  $\mathbb{N}$  is .....  
**[a]** {2 , 1 , 0 , -1 , -2 .....}                      **[b]** {2 , 1 , 0}  
**[c]** {1 , 0 , -1 , -2 , .....}                      **[d]** {1 , 0}
- d** The S.S. of the inequality :  $4 - x > 3$  in  $\mathbb{Z}^+$  is .....  
**[a]** {0 , -1 , -2 , -3 , .....}                      **[b]** {0 , 1 , 2 , 3 , .....}  
**[c]** {0}                      **[d]**  $\emptyset$
- e**  If  $2x + 5 > 3$  and  $x \in \mathbb{Z}$  , then the solution set = .....  
**[a]**  $\mathbb{N}$                       **[b]**  $\mathbb{N} - \{0\}$                       **[c]**  $\mathbb{Z}^-$                       **[d]**  $\mathbb{Z}^+$
- f** The S.S. of the inequality :  $-2x < 0$  in  $\mathbb{Z}$  is .....  
**[a]**  $\emptyset$                       **[b]**  $\mathbb{N}$                       **[c]**  $\mathbb{Z}^-$                       **[d]**  $\mathbb{Z}^+$
- g** If  $x \in \mathbb{N}$  , then the S.S. of the inequality :  $-x > 3$  is .....  
**[a]** {4 , 5 , .....}                      **[b]** {-4 , -5 , -6 , .....}                      **[c]** {-3}                      **[d]**  $\emptyset$



# Unit 3



## *Geometry And Measurement*

## The distance between two points in the coordinate plane

In the opposite figure :

If the points A , B , C and D represent the numbers  $-6$  ,  $-1$  ,  $0$  and  $3$  respectively , then complete :

AB = .....

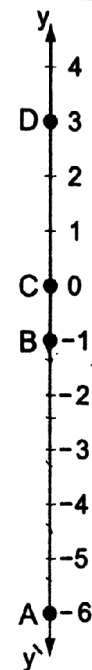
AC = .....

BC = .....

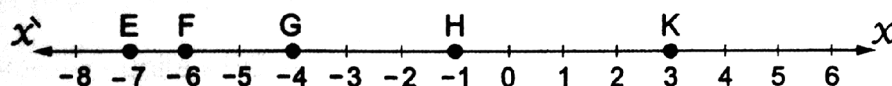
BD = .....

AD = .....

CD = .....



From the following figure complete :



EF = .....

EK = .....

FK = .....

EG = .....

FG = .....

GK = .....

EH = .....

FH = .....

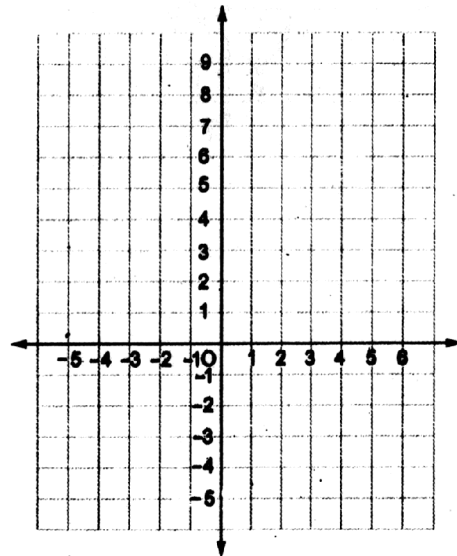
HK = .....





In the opposite coordinate plane :

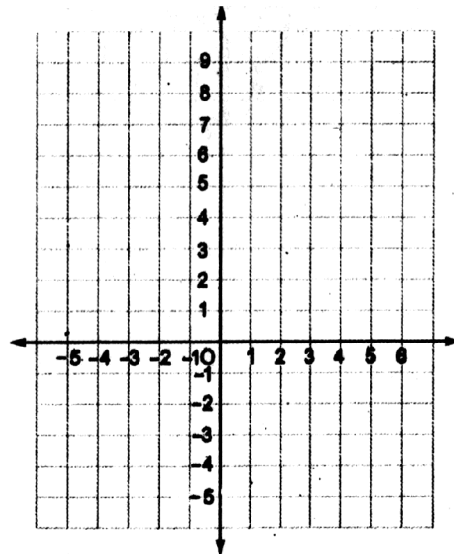
- a** Determine the position of the following points : A  $(-3, -3)$  , B  $(-3, 2)$  , C  $(5, 2)$  and D  $(5, -3)$  and mention the name of the shape ABCD
- .....



- b** Find the perimeter and the area of the shape ABCD
- .....
- .....

In the opposite coordinate plane :

- a** Determine the position of the following points : L  $(-1, 1)$  , M  $(1, 1)$  , N  $(1, 8)$  and E  $(-1, 8)$
- b** Find the perimeter and the area of the shape LMNE



- c** Determine whether the shape is symmetric or not ?



Complete each of the following :

**a** The image of the point (2 , 5) by translation

$(x, y) \longrightarrow (x + 2, y + 1)$  is .....

**b** The image of the point (3 , 2) by translation

$(x, y) \longrightarrow (x + 3, y - 2)$  is .....

**c** The image of the point (- 5 , 4) by translation

$(x, y) \longrightarrow (x + 4, y - 5)$  is .....

**d** The image of the point (- 1 , 3) by translation (2 , - 3) is .....

**e** The image of the point (0 , 5) by translation (- 2 , 1) is .....

**f** The image of the point (- 2 , - 5) by translation

$(x, y) \longrightarrow (x - 2, y)$  is .....

**g** The image of the point (3 , - 2) by translation

$(x, y) \longrightarrow (x, y + 3)$  is .....

**h** The image of the point by the translation

$(x, y) \longrightarrow (x - 2, y + 3)$  is (7 , 4)

**i** If the image of the point (3 , 2) is the point (6 , 1) , then the translation

rule is  $(x, y) \longrightarrow (\dots, \dots)$

**j** The image of the point A (3 , 6) by translation 3 units in the negative direction of x-axis is .....

Choose the correct answer :

**a** The image of the point A (1 , 2) by translation (1 , - 1) is .....

[a] (2 , 1)      [b] (2 , 3)      [c] (1 , 1)      [d] (1 , 3)

**b** The image of the point A (- 4 , 3) by translation (- 1 , - 4) is .....

[a] (- 5 , - 7)      [b] (- 5 , - 1)      [c] (- 7 , 3)      [d] (- 3 , - 1)

**c** The image of the point (5 , 0) by translation (1 , - 5) is .....

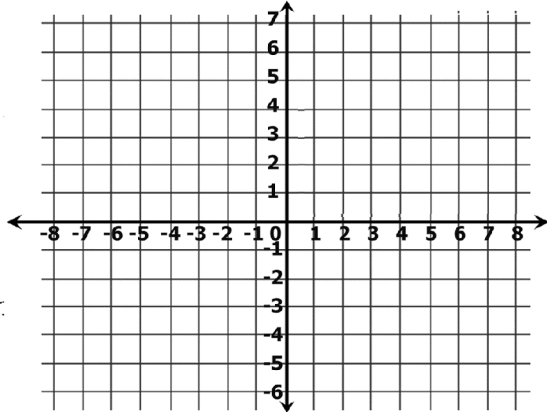
[a] (- 5 , 6)      [b] (6 , - 5)      [c] (0 , 1)      [d] (1 , 0)



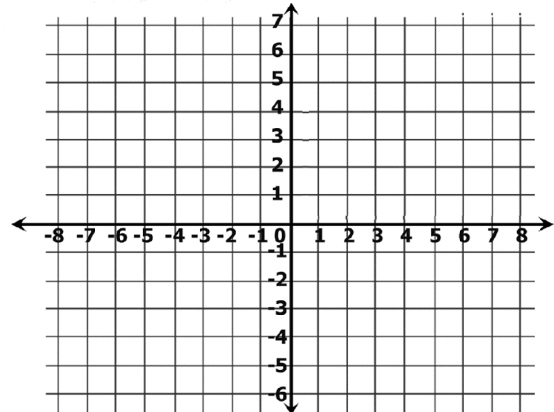
- d** The image of the point  $(3, -2)$  by translation  $(-3, 2)$  is .....  
 [a]  $(0, 0)$  [b]  $(2, 0)$  [c]  $(3, 0)$  [d]  $(6, 4)$
- e** The image of the point  $(3, -2)$  by translation  $(4, 2)$  is .....  
 [a]  $(-7, 0)$  [b]  $(7, 0)$  [c]  $(-1, 4)$  [d]  $(1, 7)$
- f** If  $(x, y)$  is the image of the point  $(3, -2)$  by translation  $(1, 3)$ , then the point  $(x, y) =$  .....  
 [a]  $(2, 1)$  [b]  $(2, 4)$  [c]  $(1, 4)$  [d]  $(4, 1)$
- g** The image of the point  $(4, 7)$  by the translation  $(x, y) \longrightarrow (x + 1, y - 2)$  is the point .....  
 [a]  $(5, 9)$  [b]  $(3, 5)$  [c]  $(5, 5)$  [d]  $(5, 7)$
- h** The image of the point  $(-1, 2)$  by translation of magnitude of 3 units in the positive direction of the  $x$ -axis is .....  
 [a]  $(-1, 5)$  [b]  $(2, 2)$  [c]  $(-2, 2)$  [d]  $(-1, 3)$
- i** The image of the point  $(-3, 4)$  by translation of magnitude of 4 units in the negative direction of the  $y$ -axis is .....  
 [a]  $(-3, 0)$  [b]  $(-7, 4)$  [c]  $(-3, 8)$  [d]  $(-1, 4)$
- j** If  $\hat{A}(3, -3)$  is the image of  $A$  by translation  $(x, y) \longrightarrow (x - 1, y - 4)$ , then the point  $A$  is .....  
 [a]  $(2, -7)$  [b]  $(4, 1)$  [c]  $(-4, -1)$  [d]  $(2, 1)$
- k** The image of the point  $(2, -1)$  by translation of magnitude 3 units in the positive direction of  $y$ -axis is .....  
 [a]  $(2, 2)$  [b]  $(5, -1)$  [c]  $(5, 2)$  [d]  $(2, -4)$
- l** The image of the point  $(3, 0)$  by translation of magnitude 3 units in the negative direction of  $x$ -axis is .....  
 [a]  $(0, 0)$  [b]  $(3, 3)$  [c]  $(3, -3)$  [d]  $(0, -3)$



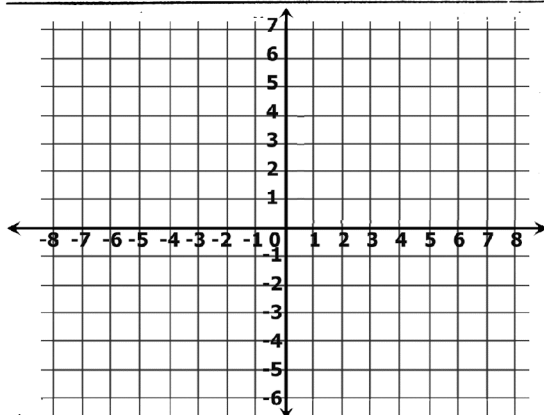
Find the image of each of the following figures by the shown translation under each figure :



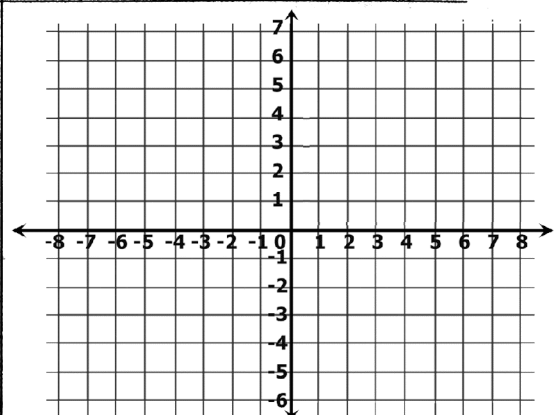
$$(x, y) \longrightarrow (x - 3, y - 4)$$



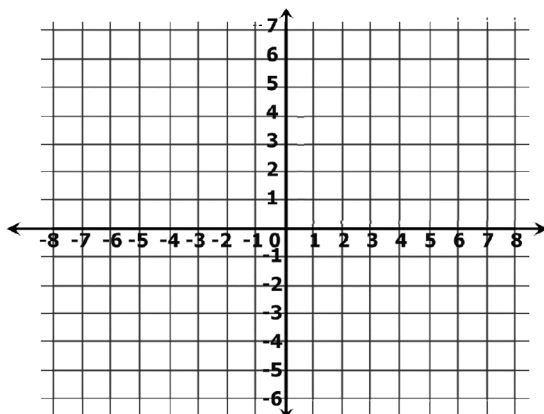
$$(x, y) \longrightarrow (x + 2, y + 3)$$



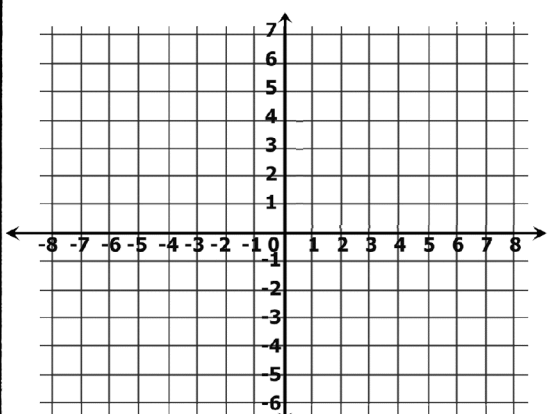
$$(x, y) \longrightarrow (x + 2, y)$$



$$(x, y) \longrightarrow (x + 3, y - 2)$$



by translation  $(3, -4)$



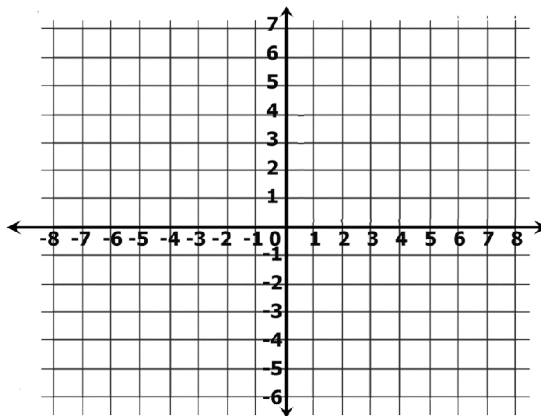
translate 1 unit to the right and 4 units down.



Copy the graph , then draw the image of the parallelogram ABCD un each of the following translations :

a  $(x, y) \longrightarrow (x + 5, y + 2)$

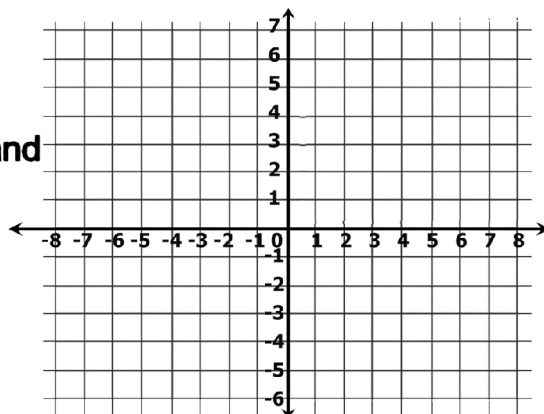
b  $(x, y) \longrightarrow (x - 8, y - 1)$



In the opposite coordinate plane ,  
Determine the following :

a The image of  $\overline{DE}$  where D (2 , 0) and  
E (− 1 , 1) by translation  
 $(x, y) \longrightarrow (x + 3, y + 2)$

b What is the name of the shape  
 $D'D'E'E'$ ? Why ?



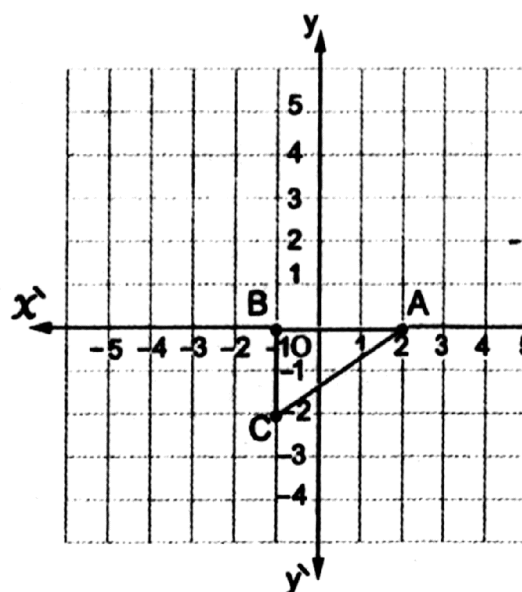
In the opposite figure :

a Determine the coordinates  
of the following points :  
A (..... , .....), B (..... , .....)  
and C (..... , .....)

b Find the image of the  $\triangle ABC$  by  
translation  $(x, y) \longrightarrow (x + 2, y + 3)$

c The length of  $\overline{BC}$  = .....  
The length of  $\overline{AB}$  = .....

d Is the  $\triangle ABC$  symmetric or not? Why ?



On the opposite coordinate plane :

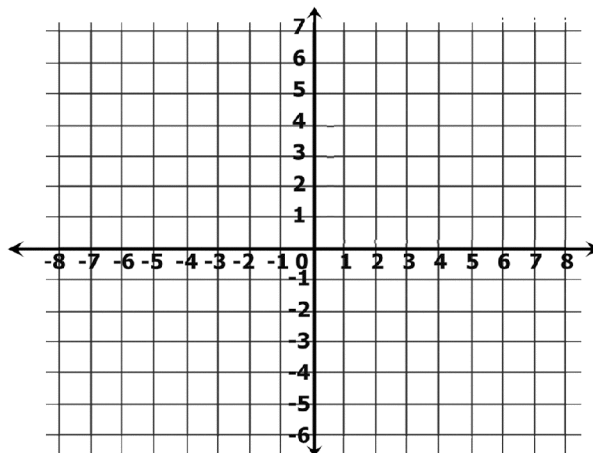
a Determine the following points :  
A (2 , - 2) , B (1 , 1) and C (1 , 6)

b Find  $\hat{A}$  which is the image of the point A by translation (2 , - 1)

c Find  $\overline{B\hat{C}}$  which is the image of  $\overline{BC}$  by translation (3 , 0)

d Find BC and  $B\hat{B}$

e Calculate the perimeter and the area for the shape  $B\hat{B}\hat{C}C$



Using the geometric tools , draw the image of each of the following :

By translation MN in the direction of  $\overrightarrow{MN}$  as shown in each case.

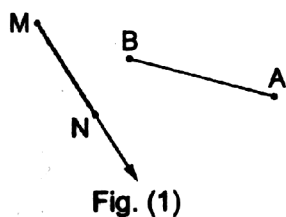


Fig. (1)

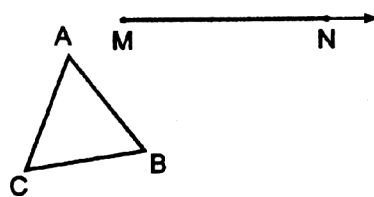
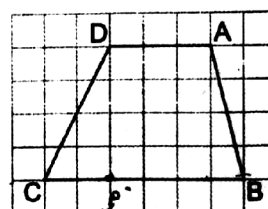
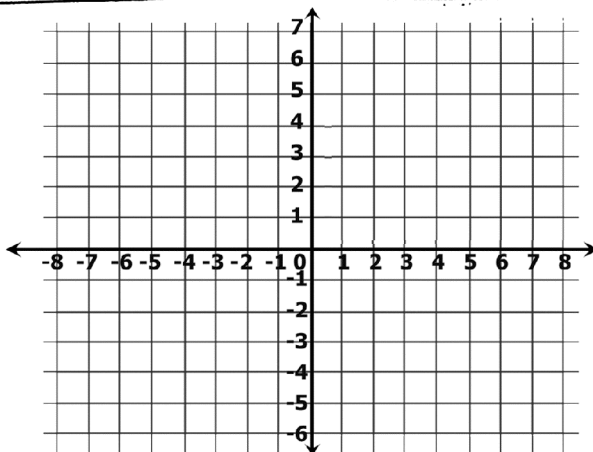


Fig. (2)

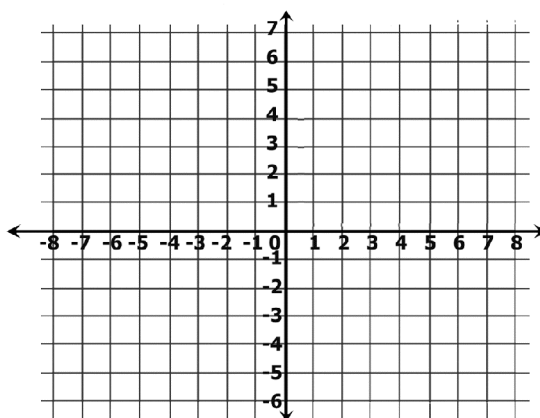
Using the grid , draw the image of the figure ABCD by the translation of 4 units in the direction of  $\overrightarrow{BC}$



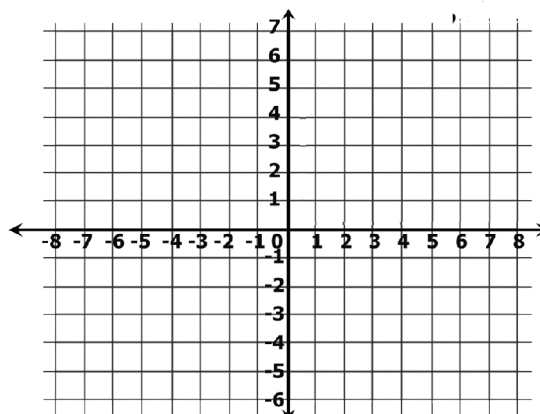
On a square lattice , draw  $\overline{AB}$  where A (2 , 3) and B (4 , 1) , then draw the image of  $\overline{AB}$  by the translation  $(x , y) \longrightarrow (x + 3 , y + 2)$



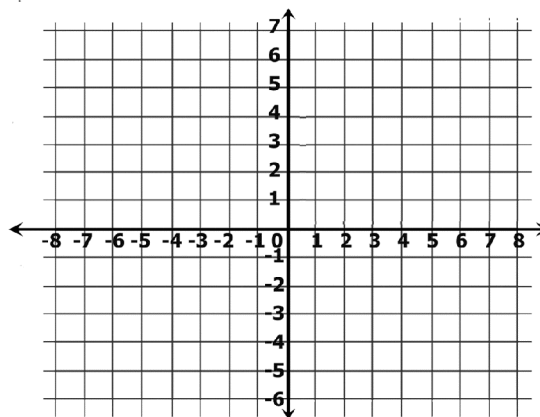
Draw  $\triangle ABC$ , where  $A(1, 1)$ ,  
 $B(-3, -1)$  and  $C(0, -5)$  then  
 determine graphically its  
 image by translation  $(5, 0)$



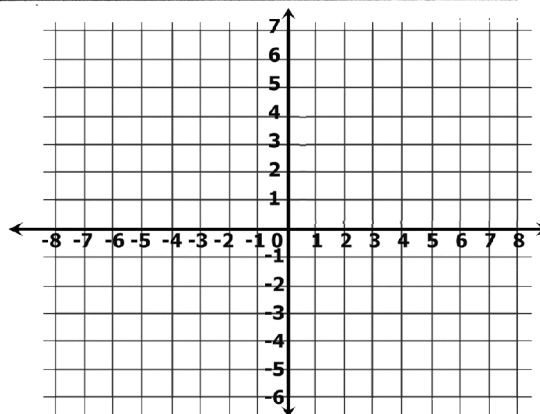
Determine in the coordinate plane  
 the following points  $A(-3, 4)$ ,  
 $B(1, 4)$  and  $C(1, 2)$ , then find :  
 (a)  $AB = \dots\dots\dots$ ,  $BC = \dots\dots\dots$   
 (b) The image of  $\triangle ABC$  by  
 the translation  $(0, -3)$



Represent the points  $A(2, 3)$ ,  
 $B(4, 3)$  and  $C(4, 7)$  in the lattice,  
 then find :  
 (a)  $BC = \dots\dots\dots$  length unit  
 $AB = \dots\dots\dots$  length unit  
 (b) The image of  $\triangle ABC$  by  
 translation  $(0, -4)$   
 (c) The area of  $\triangle ABC$



The point  $\hat{A}(3, -3)$  is the image of  
 the point  $A$  by the translation  
 $(x, y) \longrightarrow (x - 1, y - 4)$  Locate  $A$ ,  
 then by the same translation,  
 draw the image of  $\triangle ABC$  where  
 $B(5, 0)$  and  $C(-1, -2)$



## Area of the circle

Find the area of the following circles where  $\pi \simeq 3.14$

**a**  $r = 8 \text{ cm.}$  area = .....

**b**  $d = 16 \text{ cm.}$  area = .....

**c**  $r = 5 \text{ km.}$  area = .....

**d**  $d = 21 \text{ m.}$  area = .....

**e**  $r = 6.3 \text{ mm.}$  area = .....

**f**  $d = 28 \text{ km.}$  area = .....

Find the area of a circle with a radius of length 21 cm. where  $\pi \simeq \frac{22}{7}$

area = .....

A circle its diameter is 12 cm. , calculate its area where ( $\pi \simeq \frac{22}{7}$  or 3.14)

area = .....





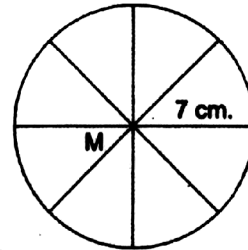
Find the area of a circle with diameter of length 17.5 cm. where  $\pi \approx \frac{22}{7}$

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In the opposite figure , a circle M of radius 7 cm. , is divided into eight equal circular sectors , calculate the area of one sector where  $\pi \approx \frac{22}{7}$



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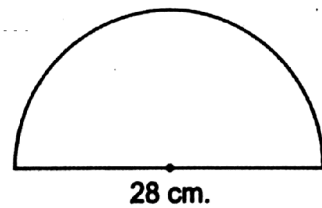
Find the area of each of the following figures where  $\pi \approx \frac{22}{7}$

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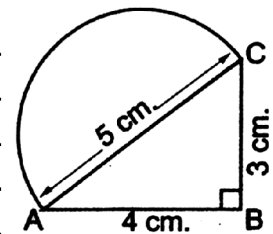


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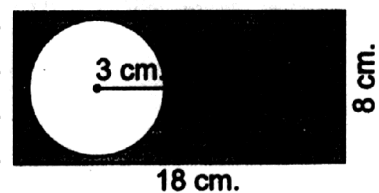
Find the area of the coloured part of each of the following figures where  $\pi = 3.14$

.....

.....

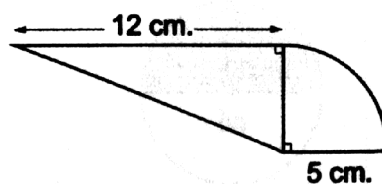
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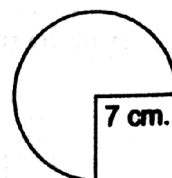


Complete :

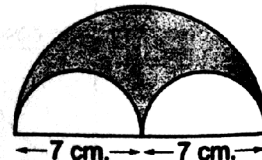
- a** The area of a circle = .....
- b** The radius of a circle is 14 cm. , then its circumference = ..... and its area = .....  $\text{cm}^2$  ( $\pi = \frac{22}{7}$ )
- c** If the area of a circle =  $25\pi \text{ cm}^2$  , then its radius = ..... cm.
- d** If the circumference =  $30\pi \text{ mm}$  . , then the area of the circle = .....
- e** The opposite figure is made up of a quarter and a triangle , then its area equals ..... cm. ( $\pi \approx 3.14$ )



- f** The area of the opposite figure = ..... cm. ( $\pi = \frac{22}{7}$ )



- g** The area of the coloured part = ..... cm. ( $\pi = \frac{22}{7}$ )



Choose the correct answer :

- a** ☐ The area of the circle = .....  
 [a]  $\pi r$  [b]  $\pi r^2$  [c]  $2\pi r$  [d]  $2\pi r^2$
- b** A circle , its diameter length is 8 cm. , its area = .....  $\text{cm}^2$   
 [a]  $8\pi$  [b]  $64\pi$  [c]  $16\pi^2$  [d]  $16\pi$
- c** The circumference of a circle is 44 cm. , then the length of its diameter is ..... cm. ( $\pi = \frac{22}{7}$ )  
 [a] 14 [b] 22 [c] 44 [d] 154
- d** The area of the circle with diameter of length 7 cm. equals .....  $\text{cm}^2$   
 [a]  $49\pi$  [b]  $49\pi^2$  [c]  $14\pi$  [d]  $12.25\pi$

A circle its circumference is  $14\pi$  m. calculate its area.

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A circle its circumference is 62.8 cm. calculate its area where  $\pi = 3.14$

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A circle its circumference is 57 cm. calculate its area. ( $\pi = \frac{22}{7}$ )

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A circle its area is  $314 \text{ cm}^2$  calculate its circumference. ( $\pi = 3.14$ )

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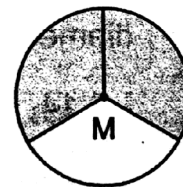
The area of a circle is  $154 \text{ cm}^2$  calculate its circumference. ( $\pi = \frac{22}{7}$ )

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In the opposite figure , a circle M is divided into three equal circular sectors , if the area of one sector is  $9.42 \text{ cm}^2$  , then find its radius length where ( $\pi = 3.14$ )



.....

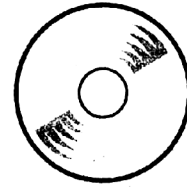
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If the length of the outer diameter of a computer CD is 12 cm. , and the length of the inner diameter is 1.5 cm find the area of this CD.

(consider :  $\pi = 3.14$ )




A garden , which is circular in shape ,  
its circumference is 132 metres , find :

First : The length of diameter of the garden in metre.

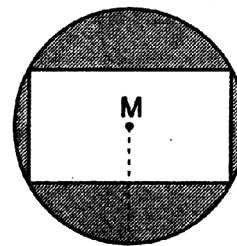
Second : The area of the garden in square metre.

(consider  $\pi = \frac{22}{7}$  )



 In the opposite figure , M is a circle of radius length 5 cm. , a rectangle is drawn inside it , its length is 8 cm. and width is 4 cm. Calculate the area of the shaded part.

( $\pi = \frac{22}{7}$  or 3.14)



# Unit 4

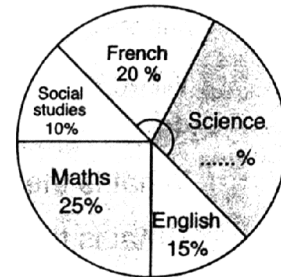


## *Statistics And Probability*

## Representing the statistical data by using the circular sectors

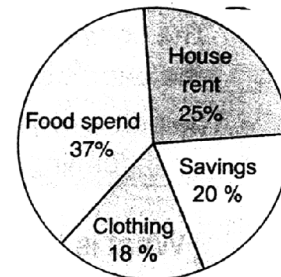
The opposite figure shows the percentages of the sales of different types of books. Complete :

- The sales percentage of science books is .....
- The least sales percentage is in .....
- The ascending order of books types according to the percentage of sales is : ..... , ..... , ..... and .....



The opposite figure shows the percentages of family spend in different purposes. Study the figure , then answer the following questions :

- What is the ratio of clothing to house rent ?
- What is the ratio of clothing to food ?
- What is the ratio of clothing to savings ?
- Find the measure of the central angle of clothing in degrees.



The following table shows the percentage of the production of four factories :

Factory	First	Second	Third	Fourth
Percentage	35 %	15 %	20 %	30 %

Represent these data by a pie chart.

.....  
 .....  
 .....  
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The following table shows the rate of the score of 200 students in one school of Helwan governorate :

Rate	Excellent	Good	Pass	Weak
Percentage	15 %	50 %	25 %	10 %

- a** Represent these data by a pie chart. **b** Find number of excellent students.

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The table shows the percentage of the four factories :

Factory	First	Second	Third	Fourth
Percentage	35 %	15 %	25 %	.....

- a** Complete the table. **b** Represent these data by a pie chart.

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The monthly income of a family is 480 pounds, the table shows the percentage of its expenditure :

Expenditure	Rent	Food	Others	Saving
Percentage	20 %	60 %	5 %	.....

- a** Complete the table. **b** Represent these data by a pie chart.

## The random experiment

Determine the sample space of each of the following random experiments , showing the number of its elements :

**a** Choosing a card from 5 cards numbered from 3 to 7 and observing the written digit on the card.

**b** Choosing one of the digits of the number 23791

**c** Choosing an even number included between 21 and 29

**d** Choosing a prime number included between 10 and 20

**e** Drawing a ball from a bag containing : one green ball , one yellow ball and one black ball and observing the colour of the drawn ball.

A bag contains 4 equal cards having the same colour and numbered from 30 to 33 Write the sample space for this experiment.

Write the sample space of tossing a coin twice in succession and observing the sequence of heads and tails showing the number of its elements.

In an experiment of getting a 2 – digit number using the digits 1 and 2 , write the sample space of this experiment.



---

A family has three children (there are no twins among them).  
Write down the sample space (S) of the gender (boy or girl) of each of  
them ordering them according to their ages.

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Determine the sample space of tossing three distinct coins once and  
observing the sequence of appearance of heads and tails.

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A coin is tossed , then a die is thrown and the upper faces of the coin  
and the die are observed.

Write down the sample space.

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An experiment consists of flipping a coin and if a head occurs then  
we flip it another time, but if a tail occurs on the first flip , then a die is  
tossed once.

List the elements of the sample space showing the number of its elements.

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## The probability

While throwing a fair die and observing the upper face , complete the following :

- a** The probability of appearance of a number greater than 2 = .....
- b** The probability of appearance of a number less than 3 = .....
- c** The probability of appearance of an even number = .....
- d** The probability of appearance of the number 4 = .....
- e** The probability of appearance of the number 7 = .....
- f** The probability of appearance of a number less than or equal to 6 = .....
- g** The probability of appearance of a prime number = .....
- h** The probability of appearance of a prime even number = .....
- i** The probability of appearance of a number divisible by 5 = .....
- j** The probability of appearance of the number 5 or the number 6 = .....

If a fair die is tossed once , what is probability of each of the following events :

- a** Appearance of an even number less than or equal to 4  
.....  
.....
- b** Appearance of a number between zero and 10  
.....  
.....
- c** Appearance of a number divisible by 7  
.....  
.....
- d** Appearance of a number that is not divisible by 2  
.....  
.....

A bag contains 25 balls (4 balls are yellow , 7 balls are red and the remainder is black). If a ball is drawn randomly , find the probability that the drawn ball is :

- |                                    |                           |
|------------------------------------|---------------------------|
| <b>a</b> black.                    | <b>b</b> yellow or black. |
| <b>c</b> not yellow.               | <b>d</b> green.           |
| <b>e</b> neither black nor yellow. |                           |

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Drawing randomly a coloured marble out of a box containing 12 red marbles , 18 white marbles and 20 blue marbles. Find the probability of selecting :

- |                                |                            |
|--------------------------------|----------------------------|
| <b>a</b> a white marble.       | <b>b</b> a red marble.     |
| <b>c</b> a yellow marble.      | <b>d</b> a non-red marble. |
| <b>e</b> a red or blue marble. |                            |

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**A number is chosen randomly from the numbers 1 , 2 , 3 , ..... , 40 , find the probability of the following events :**

- a** A : the chosen number is a multiple of 3
- b** B : the chosen number is divisible by 7
- c** C : the chosen number is greater than 16 and less than 25
- d** D : the chosen number is a prime number less than 16
- e** E : the chosen number is divisible by 2 and 3
- f** F : the chosen number has 7 as a units digit.

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**By using cardboard , cut 10 squared or rectangular equal cards and have the same colour , then write a number in each one of them from the numbers (1 to 10) , then put them in a bag that is not transparent and mix them carefully , choose one of them at random. Calculate the probability of the following events :**

- a** The event A : appearance of a number more than 7
- b** The event C : appearance of an odd number.
- c** The event B : appearance of a number that satisfies the inequality  $x \leq 10$
- d** The event D : appearance of a number that satisfies the equation :

$$x - 4 = 2$$



Complete the following :

- a** The probability of the impossible event = .....  
and the probability of the certain event = .....
- b** For every event A , we find that .....  $\leq P(A) \leq$  .....
- c** If a fair coin is tossed once , then the probability of appearance of a head = .....
- d** 10 cards are numbered from 1 to 10 A card is drawn randomly ,  
then the probability that the card carries an odd number = .....
- e** A box contains 5 white balls , 7 red balls and 3 blue. If a ball is drawn from  
the box randomly , then the probability that the drawn ball is blue = .....
- f** In the experiment of throwing a fair die and observing the number on  
the upper face , then the probability of getting a number less than 1  
equals .....
- g** A box contains 48 oranges , 4 of them are bad. If we draw an orange  
at random , then the probability that the drawn orange is bad = .....  
and the probability that it is not bad = .....
- h** If the probability of the occurrence of an event is  $\frac{5}{8}$  ,  
then the probability of the non-occurrence of this event is .....
- i** A room has 3 doors numbered from 1 to 3 , one student goes out from one  
door. The probability that he goes out from the door number 2 is .....
- j** A letter is selected randomly from the word "SAMEH" , then the  
probability of selecting the letter E is .....

**a** Which of the following is the probability of occurrence of an event ? .....

- [a]** 1.2      **[b]** -0.4      **[c]** 315 %      **[d]** 75 %

[a]  $\frac{1}{6}$                       [b]  $\frac{1}{3}$                       [c]  $\frac{1}{2}$                       [d] 1

[a]  $\frac{3}{20}$       [b]  $\frac{4}{20}$       [c]  $\frac{5}{20}$       [d]  $\frac{6}{20}$

[a]  $\frac{3}{5}$                       [b]  $\frac{3}{8}$                       [c]  $\frac{5}{8}$                       [d]  $\frac{5}{3}$

[a]  $\emptyset$                       [b] zero                      [c]  $\frac{1}{6}$                       [d]  $\frac{1}{3}$

[a]  $\frac{1}{20}$       [b]  $\frac{4}{9}$       [c]  $\frac{1}{25}$       [d]  $\frac{5}{9}$

**[a]**  $\frac{1}{2}$       **[b]**  $\frac{1}{3}$       **[c]**  $\frac{1}{4}$       **[d]** zero

**[a]**  $\frac{5}{6}$                       **[b]**  $\frac{2}{3}$                       **[c]**  $\frac{1}{2}$                       **[d]**  $\frac{1}{6}$

**[a] 0.7**                      **[b] 0.07**                      **[c] 0.3**                      **[d] 0.03**

