NCERT Exercises (Questions-Solutions)

Exercise 11.1

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1. **Find the rule which gives the number of match sticks required to make the following matchstick patterns. Use a variable to write the rule.**

(a) A pattern of letter T as T

(b) A pattern of letter Z as Z

(c)A pattern of letter U as U

(d) A pattern of letter V as V

(e) A pattern of letter E as E

(f) A pattern of letter S as S

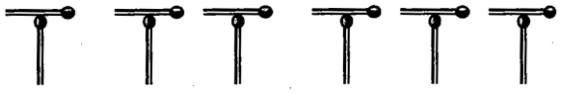
(g) A pattern of letter A as A

TIPS

Firstly, form the given letter by matchsticks and then form the pattern.

Since, number of letter is increasing in this pattern, so let the number of letter is a variable. Put the different values 1, 2, 3,... n, of variable, find number of matchsticks and then get the required rule.

Sol. (a) One T can be formed by 2 matchsticks and 2T can be formed by 4 matchsticks. Thus, we get the following patterns of letter T.



Here, the number of Ts is increasing.

So, let variable n denotes the number of Ts.

Now, number of matchsticks required to make pattern of T are given below:

For $n=1$, the number of matchsticks required

$=2\times1=2$

For $n=2$, the number of matchsticks required

$=2\times2=4$

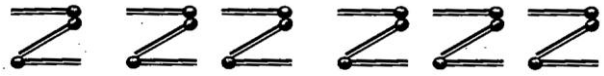
For $n=3$, the number of matchsticks required

$=2\times3=6$

For $n=n$, the number of matchsticks required $=2\times n=2re$

Hence, the required rule for a pattern of letter T is $2n$.

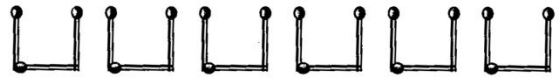
(b) One Z can be formed by 3 matchsticks and 2Z can be formed by6 matchsticks. Thus, we get the following patterns of letter Z.



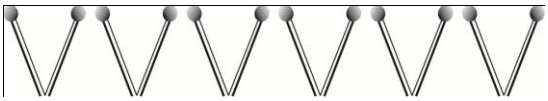
Here, the number of Zs is increasing.

So, let variable re denotes the number of Zs.

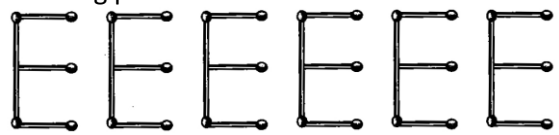
Now, the number of matchsticks required to make pattern of 'Z' are given below:
For $n=1$, the number of matchsticks required
$=3\times1=3$
For $n=2$, the number of matchsticks required $=3\times2=6$
For $n=3$, the number of matchsticks required $=3\times3=9$
For $n=n$, the number of matchsticks required $=3\times n=3n$
Hence, the required rule for a pattern of letter Z is 3re.
(c) One U can be formed by 3 matchsticks and 2U can be formed by6 matchsticks. Thus, we get the following pattern of letter U.



Here, the number of Us is increasing.
Let variable re denotes the number of Us.
Now, the number of matchsticks required to make pattern of 'U' are given below:
For $n=1$, the number of matchsticks required $=3\times1=3$
For $n=2$, the number of matchsticks required $=3\times2=6$
For $n=3$, the number of matchsticks required $=3\times3=9$
For $n=n$, the number of matchsticks required $=3\times n=3n$
Hence, the required rule for a pattern of letter U is 3re.
(d) One V can be formed by 2 matchsticks and 2V can be formed by4 matchsticks. Thus, we get the following pattern of letter V.

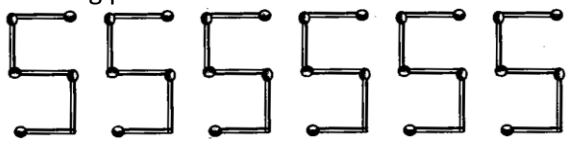


Here, the number of Vs is increasing.
Let variable n denotes the number of Vs.
Now, the number of matchsticks required to make pattern of 'V' are given below:
For $n=1$, the number of matchsticks required $=2\times1=2$
For $n=2$, the number of matchsticks required
$=2\times2=4$
For $n=3$, the number of matchsticks required $=2\times3=6$
For $n=n$, the number of matchsticks required $=2\times n=2n$
Hence, the required rule for a pattern of letter V is $2n$.
(e) One E can be formed by 5 matchsticks and 2E can be formed by 10 matchsticks. Thus, we get the following pattern of letter E.



Let variable re denotes the number of Es.
Now, the number of matchsticks required to make pattern of 'E' are given below:
For $n=1$, the number of matchsticks required $=5\times1=5$
For $n=2$, the number of matchsticks required $=5\times2=10$
For $n=3$, the number of matchsticks required $=5\times3=15$
For $n=n$, the number of matchsticks required $=5\times n=5n$.
Hence, the required rule for a pattern of letter E is 5re.

(f) One S can be formed by 5 matchsticks and 2S can be formed by 10 matchsticks. Thus, we get the following pattern of letter S.



Let variable n denotes the number of Ss.

Now, number of matchsticks required to make pattern 'S' is

For $n=1$, number of matchsticks $=5\times1=5$

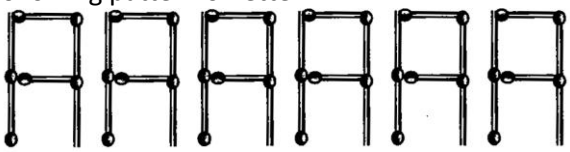
For $n=2$, number of matchsticks $=5\times2=10$

For $n=3$, number of matchsticks $=5\times3=15$

For $n=n$, number of matchsticks $=5\times n=5n$

Thus, the required rule for a pattern of letter S is 5re.

(g) One A can be formed by 6 matchsticks and 2A can be formed by12 matchsticks. Thus, we get the following pattern of letter A.



Here, the number 'of As is increasing.

Let variable n denotes the number of As.

Now, the number of matchsticks required to make pattern 'A' is

For $n=1$, the number of matchsticks required $=6\times1=6$

For $n=2$, the number of matchsticks required $=6\times2=12$

For $n=3$, the number of matchsticks required $=6\times3=18$

For $n=n$, the number of matchsticks required $=6\times n=6n$

Hence, the required rule for a pattern of letter 'A' is $6n$.

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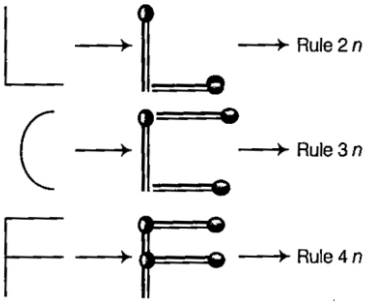
2. We already know the rule for the pattern of letters L, C and F. Some of the letters from question 1 (given above) give us the same rule as that given by 'L'. Which are these? Why does this happen?

Sol. Rules for the pattern of letters L, C and F areas follow:



In question 1, letter T and V have same rule as that given by L. This happens because the number of matchsticks required in each of them is 2.

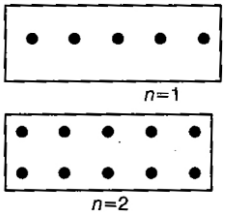
3. Cadets are marching in a parade. There are 5 cadets in a row. What is the rule which gives the number of cadets, given the number of rows? (Use *n* for the number of rows.)

Sol. Let the number of rows $= n$

Given, the number of cadets in each row = 5

$\therefore$ Total number of cadets $= 5n$

Here, $\bullet = 1$ cadet



Hence, rule to find the number of cadets in 'n' rows is 5n.

4. If there are 50 mangoes in a box, how will you write the total number of mangoes in terms of the number of boxes? (Use b for the number of boxes).

Sol. Given, b is the number of boxes and, the number of mangoes in a box = 50

When there is one box i.e. *b*=1, then the number of mangoes = 50 $\times$ 1i.e. 50.

When there are two boxes i.e. *b*=2, then the number of mangoes=50$\times$ 2 i.e. 100

When there are three boxes i.e. *b*=3, then the number of mangoes= 50 $\times$ 3 i.e. 150

When there are *b* boxes i.e. *b*=*b*, then the number of mangoes=50$\times$ *b*=50 *b*

Hence, total number of mangoes in terms of number of boxes can be written as 50 *b*.

5. The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Uses for the number of students).

Sol. Let number of students = s

Given, number of pencils distributed to each student =5

When there is one student i.e. s = 1, then number of pencils =5$\times$ 1i.e. 5

When there are two students i.e. s = 2, then number of pencils =5$\times$ 2i.e. 10

When there are three students i.e. s = 3, then number of pencils =5$\times$ 3i.e. 15

When there are s students i.e. s = s, then number of pencils = 5$\times$ s i.e. 5s

Hence, 5s pencils are needed for s students.

6. A bird flies 1 kilometer in one minute. Can you express the distance covered by the bird in terms of its flying time in minutes? (Use t for flying time in minutes).

Sol. Let flying time of bird = *t* min.

Then, bird flies in one min = 1 km

$\therefore$ Bird flies in *t*min = *t*$\times$ 1 km = *t*km

Hence, the distance covered by the bird in its flying time i.e. in *t* minis *t* km.

7. Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder). She has 9 dots in a row. How many dots will her Rangoli have for r rows? How many dots are there, if there are 8 rows? If there are 10 rows?

Sol. Given, the number of rows = *r*

and the number of dots in one row i.e. *r* = 1 is 9$\times$ 1=9

$\therefore$ the number of dots in 2 rows i.e. *r* = 2 is

9$\times$ 2=18the number of dots in 3 rows i.e.

r= 3 is 9×3=27
$\therefore$ Total number of dots in $r$rows is
= 9 $\times r$= 9r
Now, if there are 8 rows i.e. r= 8, then the number of dots=9×8=72 dots and for
r= 10, the number of dots = 9 $\times$ 10 = 90 dots.

8. Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms ofRadha's age? Take Radha's age to be x years.

Sol. Let Radha's age be $=x\ yr$
Given, the Leela is 4 yr younger than Eadha.
So, age of Leela = (Age of Radha) $-4\,yr$
$\Rightarrow$ Age of Leela $=(x-4)\,\text{yr}$
Thus, yes we can write Leela's age in terms of Radha's age.

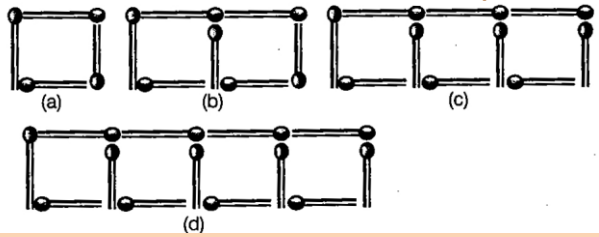
9. Mother has made laddus. She gives some laddus toguests and family members; still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?

Sol. Given, the number of laddus given away by mother $=l$
and the number of laddus left over =5
$\therefore$ Total number of laddus made by mother
= Number of laddus given away + Number of laddus left over $=l+5$
Hence, the number of laddus made by mother is $l+5$.

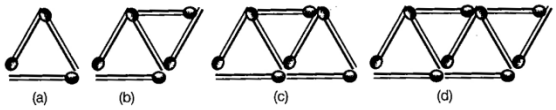
10. Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still 10 oranges remain outside. If the number of oranges in a small box are taken to be x, what is the number of oranges in the larger box?

Sol. Given, the number of oranges in a smaller box $=x$
Since, one larger box is emptied to fill two smaller boxes.
So, the number of oranges in two smaller boxes $=2\times$
The number of oranges in one box $=2\times x=2x$
Also, 10 oranges remain outside, when large box is emptied to fill two smaller boxes.
So, number of oranges in the larger box = Number of oranges in two smaller boxes + Oranges left over = $=2x+10$
Hence, the number of oranges in the larger box is $(2x+10)$.

11. (i) Look at the following matchstick pattern of squares. The squares are not separate. Two neighboring squares have a common matchstick. Observe the patterns and find the rule that gives the number of matchsticks in terms of the number of squares.



(Hint: If you remove the vertical stick at the end, you will get a pattern of Cs.)
(ii) Figure depict below gives a matchstick pattern of triangles. As in Exercise 11 (A) above, find the general rule that gives the number of matchsticks in terms of the number of triangles.



Sol (i) In figures,

Number of squares = 1and number of matchsticks $=4=3\times1+1$

= 3 $\times$ Number of square + 1

(b) Number of squares = 2

and number of matchsticks $=7=3\times2+1$

= 3 $\times$ Number of squares + 1

(c) Number of squares = 3

and number of matchsticks $=10=3\times3+1$

= 3 $\times$ Number of squares + 1

(d) Number of squares = 4

and number of matchsticks $=13=3\times4+1$

= 3 $\times$ Number of squares + 1

Thus, if number of squares $=x$

Then, number of matchsticks $=3\times$ Number of squares + 1

$=3x+1$

Hence, the required rule that gives the number of matchsticks is $3x+1$, where x is number of squares.

(ii) In figures,

Number of triangles = 1

and number of matchsticks $=3=2\times1+1$

= 2$\times$ Number of triangle +1

(b) Number of triangles = 2

and number of matchsticks $=5=2\times2+1$

= 2$\times$ Number of triangles + 1

(c) Number of triangles = 3

and number of matchsticks $=7=2\times3+1$

= 2$\times$ Number of triangles + 1

(d) Number of triangles = 4

and number of matchsticks $=9=2\times4+1$

= 2$\times$ Number of triangles + 1

Thus, if number of triangles $=x$

Then, number of matchsticks $=2\times$ Number of triangles $+1=2x+1$

Hence, the required rule that gives the number of matchsticks is $2x+1$, where x is number of triangles.

Exercise 11.2

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1. The side of an equilateral triangle is shown by l .Express the perimeter of the equilateral triangle using l .

Sol. Let ΔABC is an equilateral triangle, where each side is denoted by l .

i.e. $AB=BC=CA=l$

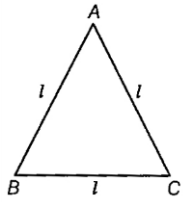
We know that, the perimeter of a triangle

= Sum of all the sides of a triangle

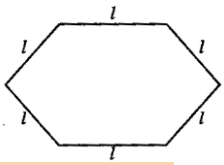
$\therefore$ Perimeter of an equilateral triangle

$= AB + BC + CA = l + l + l = 3l$

Thus, the perimeter of an equilateral triangle using l can be expressed as $3l$.



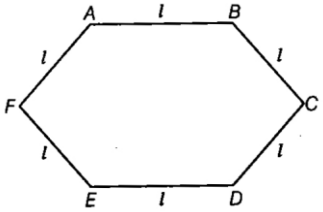
2. The side of a regular hexagon is denoted by l. Express the perimeter of the hexagon using l.



(Hint: A regular hexagon has all its six sides equal in length).

Sol. Let *ABCDEF* is the given regular hexagon whose each side is denoted by l.

i.e. $AB = BC = CD = DE = EF = FA = l$



We know that, perimeter of a regular hexagon

= Sum of all the sides of hexagon

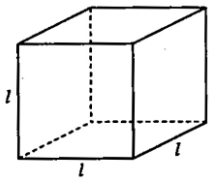
$\therefore$ Perimeter of a regular hexagon

$= AB + BC + CD + DE + EF + FA$

$= l + l + l + l + l + l = 6l$

Hence, perimeter of a hexagon using l can be expressed as $6l$.

3. A cube is a three-dimensional figure as shown in figure. It has six faces and all of them are identical squares. The length of an edge of the cube is given by l. Find the formula for the total length of the edges of a cube.



Sol. We know that, a cube is a three-dimensional figure which has six faces and 12 edges.

Given, that all edges are equal in length and length of edge $= l$

Now, total length of the edges of a cube

= Sum of all 12 edges of a cube

$= l + l + l + l + l + l + l + l + l + l + l + l$

$= 12l$

Hence, the required formula for the total length of the edges of a cube is $12l$, where $l =$ length of an edge.

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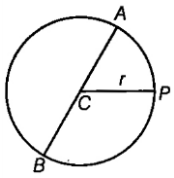
4. **The diameter of a circle is a line, which joins two points on the circle and also passes through the centre of the circle. (In the figure given below, AB is a diameter of the circle, is its centre). Express the diameter of the circle (d) in terms of its radius (r).**



Sol. Given, AB is diameter of the circle. Also, C is the centre of the circleand PC is the radius.
We know that, diameter of a circle $=2\times$ radius $=2\times PC$
$\Rightarrow d=2\times r \quad \Rightarrow \quad d=2r$
Hence, the diameter of the circle in terms of its radius can beexpressed as $d=2r$.

5. **To find sum of three numbers 14, 27 and 13, we canhave two ways**
(a) We may first add 14 and 27 to get 41 and then add 13 toit to get the total sum 54
or
(b) We may add 27 and 13 to get 40 and then add 14 to getthe sum 54. Thus, (14 + 27) + 13 = 14 + (27 + 13)
This can be done for any three numbers. This property isknown as the associatively of addition of numbers.Express this property which we have already studied inthe chapter on Whole Numbers, in a general way, byusing variables *a*, *b* and *c*.

Sol. According to the question,
Sum of three numbers 14, 27 and 13 can be found in two ways,(14 + 27) + 13 = 41 + 13 = 54
(b)(27 + 13) + 14 =40+ 14 =54
or 14+ (27 + 13) =54
Thus, (14 + 27) + 13 = 14 + (27 + 13) = 54
By using variables, we can write this property of numbers also ingeneral way. Let *a*, *b* and *c* be three numbers each of which can takeany numerical value. Then, (*a* + *b*) + *c* = *a* + (*b* + *c*)
This property is called an **associativity of addition** of numbers.

Exercise 11.3

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1. **Make up as many expressions with numbers (novariables) as you can from three numbers 5, 7 and 8. Everynumber should be used not more than once. Use onlyaddition, subtraction and multiplication.**
(**Hints:** Three possible expressions are $5+(8-7), 5-(8-7), (5\ x\ 8)+7$, make the other expressions.)

Sol. The possible expressions formed by three numbers 5, 7 and 8 are
$5+(8-7), 5-(8-7), (5\times 8)+7, (5+8)+7,$
$5-(8\times 7), (5+8)-7, (5\times 8)-7, 8\times(7+5)$ etc.

2. Which out of the following are expressions with numbersonly?

(a) $y+3$ **(b)** $(7\times20)-8z$

(c) $5(21-7)+7\times2$ **(d) 5**

(e) $3x$ **(f)** $5-5n$

(g) $(7\times20)-(5\times10)-45+p$

Sol. (a) $y+3$, Here, variable y is present. So, it is not an expression withnumbers only.

(b) $(7\times20)-8z$, Here, variable z is present. So, it is not anexpression with numbers only.

(c) $5(21-7)+7\times2$, Here, no variable is present. So, it is anexpression with numbers only.

(d) 5, Here, no variable is present. So, it is an expression withnumber only.

(e) $3x$, Here, variable x is present. So, it is not an expression withnumbers only.

(f) $5-5n$, Here, variable n is present. So, it is not an expressionwith numbers only.

(g) $(7\times20)-(5\times10)-45+p$. Here, variable p is present. So, it isnot an expression with numbers only.

From above it is clear that (c) and (d) are expressions withnumbers only.

3. Identify the operations (addition, subtraction, division,multiplication) in forming the following expressions and tellhow the expressions have been formed.

(a) $z+1, z-1, y+17, y-17$ **(b)** $17y, \frac{y}{17}, 5z$

(c) $2y+17, 2y-17$ **(d)** $7m, -7m+3, -7m-3$

Sol. (a) (i) $z+1$, Here, operation is addition and expression is formed byadding 1 to z.

(ii) $z-1$, Here, operation is subtraction and expression is formed bysubtracting 1 from z.

(iii) $y+17$, Here, operation is addition and expression is formed byadding 17 to y.

(iv) $y-17$, Here, operation is subtraction and expression is formedby subtracting 17 from y.

(b) (i) $17y$, Here, operation is multiplication and expression is formedby multiplying y by 17.

(ii) $\frac{y}{17}$, Here, operation is division and expression is formed bydividing y by 17.

(iii) $5z$, Here, operation is multiplication and expression is formed bymultiplying z by 5.

(i) $2y+17$, Here, operation is multiplication and addition and toform an expression firstly 2 is multiplied by y and then 17 isadded to $2y$.

(ii) $2y-17$, Here,operation is multiplication and subtraction and toform an expression, firstly y is multiplied by 2 and then 17 issubtracted from $2y$.

(d) (i) $7m$, Here, operation is multiplication and expression is formedon multiplying m by 7.

(ii) $-7m+3$, Here, operation is multiplication and addition and, toform an expression, firstly m is multiplied by (-7) and then 3 isadded to $-7m$.

(iii) $-7m+3$, Here, operation is multiplication and subtraction and toform an expression, firstly m is multiplied by (-7) and then is 3subtracted from $-7m$.

4. Give expressions for the following cases.

(a) 7 added to p **(b) 7 subtracted from p**

(c) p multiplied by 7 **(d) p divided by 7**

(e) 7 subtracted from $-m$ **(f) $-p$ multiplied by 5**

(g) $-p$ divided by 5 **(h) p multiplied by -5**

Sol. (a) When 7 is added to p, then expression is $p+7$.

(b) When 7 is subtracted from p, then expression is p -7.
(c) When p is multiplied by 7, then expression is $7\times p=7p$
(d) When p is divided by 7, then expression is $\frac{p}{7}$.
(e) When 7 is subtracted from $-m$, then expression is $-m-7$.
(f) When $-p$ is multiplied by 5, then expression is $-p\times 5=-5p$.
(g) When $-p$ is divided by 5, then expression is $\frac{-p}{5}$.
(h) When p is multiplied by -5, then expression is $p\times -5=-5p$.

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5. Give expressions in the following cases.
(a) 11 added to $2m$
(b) 11 subtracted from $2m$
(c) 5 times y to which 3 is added
(d) 5 times y from which 3 is subtracted
(e) y is multiplied by -8
(f) y is multiplied by -8 and then 5 is added to the result
(g) y is multiplied by 5 and the result is subtracted from 16
(h) y is multiplied by -5 and the result is added to 16.

Sol. (a) When 11 is added to $2m$, then expression is $2m+11$.
(b) When 11 is subtracted from $2m$, then expression is $2m-11$.
(c) 5 times of y is $5y$, when 3 added to $5y$, then expression is $5y+3$.
(d) 5 times of y is $5y$, when 3 is subtracted from $5y$, then expression is $5y-3$.
(e) When y is multiplied by -8, then expression is $-8y$.
(f) When y is multiplied by -8, then result is $-8y$ and then 5 is added to it, then expression will be $-8y+5$.
(g) When y is multiplied by 5, then result is $5y$ and then this result is subtracted from 16, then expression will be $16-5y$.
(h) When y is multiplied by -5, then result is $-5y$ and then this result is added to 16, then expression will be $-5y+16$.

6. (a) Form expressions using t and 4. Use not more than one number operation. Every expression must have tin it.
(b) Form expression using $y, 2$ and 7. Every expressionmust have y in it. Use only two number operations. These should be different.

Sol. (a) By using only one number operation, we can form the following expressions
$t+4, t-4, 4t, \frac{t}{4}, \frac{4}{t}, 4-t, 4+t$, etc.
(b) By using only two number operations, we can form followingexpressions by using y, 2 and 7

$2y+7, 2y-7, 7y+2, 7y-2,$

$\frac{y}{2}+7, \frac{y}{2}-7, \frac{y}{7}+2, \frac{y}{7}-2,$

All these expressions are different.

Exercise 11.4

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Answer the following.

1. (a) Take Santa's present age to be y years.

(i) What will be her age 5 years from now?

(ii) What was her age 3 years back?

(iii) Sarita's grandfather is 6 times her age.What the age of her grandfather?

(iv) Grandmother is 2 years younger than grandfather.What is grandmother's age?

(v) Sarita's father's age is 5 years more than 3 timeSarita's age. What is her father's age?

Sol. Let Santa's present age = y yr

(i) Sarita's age after 5 yr from now $=(y+5)\ yr$

(ii) Santa's age 3 yr back $=(y-3)\ yr$

(iii) Given, Sarita's grandfather is 6 times of her age

So, Sarita's grandfather age $=6\times$ Sarita's present age $=6\times y=6y yr$

(iv) Given, grandmother is 2 yr younger than grandfather.

Age of grandfather = 6y yr [from (iii)]

$\therefore$ Age of grandmother

= [Grandfather's age -2] yr

$=(6y-2)yr$

(v) Given, Sarita's father's age is 5 yr more than 3 times Sarita's age.

Sarita's present age = y yr

3 times of Sarita's age = 3y yr

$\therefore$ Sarita's father age $=3\times$ Sarita's age + 5

$=(3y+5)\ yr$

(b) The length of a rectangular hall is 4 meters less than3 times the breadth of the hall. What is the length, if thebreadth is b meters?

Sol. Given, the breadth of the hall = *b* m

Now, according to the question,

Length of hall = 4 m less than 3 times the breadth of the hall

= (3 $\times$ breadth of hall) – 4

$=(3\times b-4)m$

$=(3b-4)\,m$

Hence, if breadth is b m, then length of hall is $(3b-4)\,m$.

(c) A rectangular box has height h cm. Its length is 5times the height and breadth is 10 cm less than the length.

Express the length and the breadth of the box in terms ofthe height.

Sol. Given, the height of a rectangular box = *h* cm
According to the question,
Length of the box = 5 times the height
$= 5h\,cm$
and breadth of the box = 10 cm less than the length
= 10 cm less than $5h$
$= (5h - 10)\,cm$

(d) **Meena, Beena and Leena are climbing the steps to the hill top. Meena is at step s, Beena is 8 steps ahead and Leena 7 steps behind. Where are Beena and Meena? The total number of steps to the hill top is 10 less than 4 times what Meena has reached. Express the total number of steps using s.**

Sol. Given, the Meena is at step = *s*
Also, Beena is 8 steps ahead.
$\therefore$ Beena is at step = *s* + 8
and Leena is 7 steps behind
$\therefore$ Leena is at step $= s - 7$
Now, total number of steps = 10 less than 4 times Meena's steps
$= 4 \times$ Meena's steps $-10 = 4s - 10$
Hence, total number of steps using scan be expressed as $(4s - 10)$.

(e) **A bus travels at υ km per hour. It is going from Daspur to Beespur. After the bus has travelled 5 hours, Beespur is still 20 km away. What is the distance from Daspur to Beespur? Express it using v.**

Sol. Given, speed of the bus $= \upsilon k / h$
i.e. Distance travelled by bus in $1h = \upsilon km$
$\therefore$ Distance travelled by bus is 5 h from Daspur $= 5\upsilon km$
After travelling 5 hours, Beespur is still 20 km away.
So, total distance from Daspur to Beespur
$= (5\upsilon + 20)\,km$.
Hence, distance from Daspur to Beespur in terms of v can be expressed as $(5\upsilon + 20)km$.

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2. **Change the following statements using expressions into statements in ordinary language.**
(For Example, Given Salim scores *r* runs in a cricket match, Nalin scores $(r + 15)$ runs. In ordinary language- Nalinscores 15 runs more than Salim).

(a) A notebook costs ₹p. A book costs ₹ 3 p.
(b) Tony puts q marbles on the table. He has 8 q marbles in his box.
(c) Our class has n students. The school has 20 n students.
(d) Jaggu is z years old. His uncle is 4z years old and his aunt is $(4z-3)$ years old.
(e) In an arrangement of dots, there are *r* rows. Each row contains 5 dots.

Sol. (a) A book costs three times the cost of a notebook.
(b) Tony's box contains 8 times the marbles on the table.
(c) Total number of students in the school is 20 times that of ourclass.
(d) Jaggu's uncle is 4 times older than Jaggu and Jaggu's aunt is 3yr younger than his uncle.
(e) The total number of dots in an arrangement is 5 times the number of rows.

3. Answer the following.
(a) Given Munnu's age to be x years, can you guess what $(x-2)$ may show?
(Hint Think of Munnu's younger brother).
Can you guess what $(x+4)$ may show? What $(3x+7)$ may show?
(b) Given Sara's age today to be y years. Think other age in the future or in the past. What will the following expression indicate?

$$y+7, y-3, y+4\frac{1}{2}, y-2\frac{1}{2}$$

(c) Given *n* students in the class like football, what may $2n$ show? What may $n/2$ show?
(Hint Think of games other than football).

Sol. (a) Given, Munnu's age $= xyr$
Then, $(x-2)$ may Munnu's younger brother or sister's age.
$(x+4)$ may show Munnu's elder brother or sister's age and $(3x+7)$ may show the age of Munnu's father or mother.
(b) Given, Sara's present age $= y\,yr$.
Then, $(y+7)$ shows Sara's age after 7 yr from now, $(y-3)$ shows Sara's age 3 yr back.
$\left(y+4\frac{1}{2}\right)$ shows Sara's age after $4\frac{1}{2}yr$ from now,
$\left(y-2\frac{1}{2}\right)$, shows Sara's age $2\frac{1}{2}yr$ back.
(c) Given, number of students like football $= n$
Now, $2n$ may show the number of students who like cricketand $\frac{n}{2}$ may show the number of students who like hockey.

Exercise 11.5

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1. State which of the following are equations (with avariable). Give reason for your answer. Identify the variablefrom the equations with a variable.

(a) $17 = x + 7$ **(b)** $(t - 7) > 5$ **(c)** $\frac{4}{2} = 2$ **(d)** $(7 \times 3) - 19 = 8$

(e) $5 \times 4 - 8 = 2x$ **(f)** $x - 2 = 0$ **(g)** $2m < 30$ **(h)** $2n + 1 = 11$

(i) $7 = (11 \times 5) - (12 \times 4)$ **(j)** $7 = (11 \times 2) + p$ **(k)** $20 = 5y$ **(l)** $\frac{3q}{2} < 5$

(m) $z + 12 > 24$ **(n)** $20 - (10 - 5) = 3 \times 5$ **(o)** $7 - x = 5$

Sol. (a) $17 = x + 7$, It is an equation with variable x, since it has an equalsign.

(b) $(t - 7) > 5$, It is not an equation because it has greater than sign (>).

(c) $\frac{4}{2} = 2$, It is an equation with numbers, since it has an equal signand has no variable.

(d) $(7 \times 3) - 19 = 8$, It is an equation with numbers, since it has anequal sign and has no variable.

(e) $5 \times 4 - 8 = 2x$, It is an equation with variable x, since it has anequal sign.

(f) $x - 2 = 0$, It is an equation with variable x, since it has an equalsign.

(g) $2m < 30$, It is not an equation because it has less than sign (<).

(h) $2n + 1 = 11$, It is an equation with variable n, since it has anequal sign.

(i) $7 = (11 \times 5) - (12 \times 4)$, It is an equation with numbers, since it hasan equal sign.

(j) $7 = (11 \times 5) - (12 \times 4)$, It is an equation with variable p, since it has anequal sign.

(k) $20 = 5y$, It is an equation with variable y, since it has an equal sign.

(l) $\frac{3q}{2} < 5$, It is not an equation because it has less than sign (<).

(m) $z + 12 > 24$, It is not an equation because it has greater than sign(>).

(n) $20 - (10 - 5) = 3 \times 5$, It is an equation with numbers, since it hasan equal sign.

(o) $7 - x = 5$, It is an equation with variable x, since it has an equalsign.

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2. **Complete the entries in the third column of the table.**

S. No.	Equation	Value of variable	Equation satisfied Yes/No
(a)	$10y = 80$	$y = 10$	
(b)	$10y = 80$	$y = 8$	
(c)	$10y = 80$	$y = 5$	
(d)	$4l = 20$	$l = 20$	
(e)	$4l = 20$	$l = 80$	
(f)	$4l = 20$	$l = 5$	
(g)	$b + 5 = 9$	$b = 5$	
(h)	$b + 5 = 9$	$b = 9$	
(i)	$b + 5 = 9$	$b = 4$	
(j)	$h - 8 = 5$	$h = 13$	
(k)	$h - 8 = 5$	$h = 8$	

(l)	$h-8=5$	$h=0$	
(m)	$p+3=1$	$p=3$	
(n)	$p+3=1$	$p=1$	
(o)	$p+3=1$	$p=0$	
(p)	$p+3=1$	$p=-1$	
(q)	$p+3=1$	$p=-2$	

TIPS

Firstly, put the given value of variable in LHS of given equation andsimplify. If value of LHS is equal to RHS, then that value of variable willsatisfy the equation otherwise not.

Sol.

S. No.	Equation	Value of variable	Equation satisfied Yes/No
(a)	$10y=80$	$y=10$	No, on putting $y=10$ in LHS equation $10y=80$, we get $LHS=10\times10=100\neq80$ i.e. $LHS\neq RHS$
(b)	$10y=80$	$y=8$	Yes, on putting $y=8$ in LHS of equation $10y=80$, we get $LHS=10\times8=80=80$ i.e. LHS = RHS
(c)	$10y=80$	$y=5$	No, on putting $y=5$ in LHS of equation $10y=80$, we get $LHS=10\times5=50\neq80$ i.e. $LHS\neq RHS$
(d)	$4l=20$	$l=20$	No, on putting $l=20$ in LHS of equation $4l=20$, we get $LHS=4\times20=80\neq20$ i.e. $LHS\neq RHS$
(e)	$4l=20$	$l=80$	No, on putting $l=80$ in LHS of equation $4l=20$, we get $LHS=4\times80=320\neq20$ i.e. LHS= RHS
(f)	$4l=20$	$l=5$	Yes, on putting $l=5$ in LHS of equation $4l=20$, we get $LHS=4\times5=20=20$ i.e. LHS = RHS
(g)	$b+5=9$	$b=5$	No, on putting $b=5$ in LHS of equation $b+5=9$, we get $LHS=5+5=10\neq9$ i.e. LHS = RHS
(h)	$b+5=9$	$b=9$	No, on putting $b=9$ in LHS of equation $b+5=9$, weget $LHS=9+5=14\neq9$ i.e. $LHS\neq RHS$
(i)	$b+5=9$	$b=4$	Yes, on putting $b=4$ in LHS of equation $b+5=9$, we get $LHS=4+5=9=9$ i.e. LHS = RHS
(j)	$h-8=5$	$h=13$	Yes, on putting $h=13$ in LHS of equation $h-8=5$, we get $LHS=13-8=5=5$ i.e. LHS = RHS
(k)	$h-8=5$	$h=8$	No, on putting $h=8$ in LHS of equation $h-8=5$, we get $LHS=8-8=0\neq5$ i.e. $LHS\neq RHS$
(l)	$h-8=5$	$h=0$	No, on putting $h=0$ in LHS of equation $h-8=5$, we get $LHS=0-8=-8-\neq5$ i.e. $LHS\neq RHS$
(m)	$p+3=1$	$p=3$	No, on putting $p=3$ in LHS of equation $p+3=1$, we get $LHS=3+3=6\neq1$ i.e. $LHS\neq RHS$
(n)	$p+3=1$	$p=1$	No, on putting $p=1$ in LHS of equation $p+3=1$, we get $LHS=1+3=4\times1$ 1 i.e. $LHS\neq RHS$

(o)	$p+3=1$	$p=0$	No, on putting $p=0$ in LHS of equation $p+3=1$, we get $LHS=0+3=3\neq 1$ i.e. $LHS\neq RHS$
(p)	$p+3=1$	$p=-1$	No, on putting $p=1$ in LHS of equation $p+3=1$, we get $LHS=-1+3=2\neq 1$ i.e. $LHS\neq RHS$
(q)	$p+3=1$	$p=-2$	Yes, on putting $p=-2$ in LHS of equation $p+3=1$, we get $LHS=-2+3=1$ i.e. $LHS\neq RHS$

3. **Pick out the solution from the values given in thebracket next to each equation. Show that the other values donot satisfy the equation.**

(a) $5m=60$ **(10, 5, 12, 15)**

(b) $n+12=20$ **(12, 8, 20, 0)**

(c) $p-5=5$ **(0,10, 5, –5)**

(d) $\frac{q}{2}=7$ **(7, 2,10,14)**

(e)r – 4=0 **(4, –4, 8,0)**

(f) $x+4=2$ **(–2,0,2,4)**

TIPS

Firstly, write the LHS and RHS of given equation. Then, put given values one by one in LHS. If value of LHS is equal to RHS, then that value of variable is the solution ofgiven equation otherwise not.

Sol. (a) Given, equation is $5m=60$

Here, LHS = 5 m and RHS = 60

Now, for $m=10$, $LHS=5\times 10=50\neq HS$

So, $m=10$ does not satisfy the equation.

For $m=5$,

$LHS=5\times 5=25\neq HS$

So, $m=5$ does not satisfy the equation.

For $m=12$ $LHS=5\times 12=60=RHS$

So, $m=12$ is the solution of given equation.

Form=15, $LHS=5\times 15=75\neq RHS$

So, $m=15$ does not satisfy the equation.

Hence, 12 is a solution of equation $5m=60$.

(b) Given, equation is $n+12=20$

Here, $LHS=n+12$ and $RHS=20$

Now, for $n=12$ $LHS=12+12=24\neq RHS$

So, $n=12$ does not satisfy the equation.

For $n=8$, $LHS=8+12=20=RHS$

So, $n=8$ is the solution of given equation.

Now, for $n=20$, $LHS=20+12=32\neq RHS$

So, $n=20$ does not satisfy the equation.

For $n=0$, $LHS=0+12=12\neq RHS$

So, $n=0$ does not satisfy the equation.

Hence, $n=8$ is a solution of equation $n+12=20$.

(c) Given, equation is $p-5=5$

Here, $LHS=p-5$ and $RHS=5$

Now,for $p=0$, $LHS=0-5=-5\neq RHS$

So, $p=0$ does not satisfy the equation.

For $p=10,\quad LHS=10-5=5=RHS$

So, $p=10$ is the solution of given equation.

Now,for $p=5,\quad LHS=5-5=0\neq RHS$

So, $p=5$ doesnot satisfy the equation.

Now,for $p=-5,\ LHS=-5-5=-10,\neq RHS$

So, $p=-5$ does not satisfy the equation.

Hence, $p=10$ is a solution of equation $p-5=5$.

(d) Given equation is $\frac{q}{2}=7.$

Here, $LHS=\frac{q}{2}$ and $RHS=7$

Now, for $q=7,\quad LHS=\frac{7}{2}=3\frac{1}{2}\neq RHS$

So, $q=7$ does not satisfy the equation.

Now,for $q=2,\ LHS=\frac{2}{2}=1\neq RHS$

So, $q=2$ does not satisfy the equation.

Now, for $q=10,\ LHS=\frac{10}{2}=5\neq RHS$

So, $q=10$ does not satisfy the equation.

For $q=14,\quad LHS=\frac{14}{2}=7=RHS$

So, $q=14$ is the solution of given equation.

Hence, $q=14$ is a solution of equation $\frac{q}{2}=7.$

(e) Given equation is $r-4=0$

Here, $LHS=r-4$ and $RHS=0$

Now,for $r=-4,\ LHS=-4-4=-8\neq RHS$

So, $r=-4$ is the solution of given equation.

Now,for $r=8,\ LHS=8-4=4\neq RHS$

So, $r=8$ does not satisfy the equation.

Now, for $r=0,\ LHS=0-4=-4\neq RHS$

So, $r=0$ does not satisfy the equation.

Hence, $r=4$ is a solution of equation $r-4=0$.

(f) Given equation is $x+4=2$

Here, $LHS=x+4$ and $RHS=2$

Now,for $x=-2,\ LHS=-2+4=2=RHS$

So, $x=-2$ is the solution of given equation.

Now,for $x=0,\ LHS=0+4=4\neq RHS$

So, does not satisfy the equation.

Now,for $x=2,\ LHS=2+4=6\neq RHS$

So, does not satisfy the equation.

Now,for $x=4,\quad LHS=4+4=8\neq RHS$

So, $x=4$ does not satisfy the equation.
Hence, $x=-2$ is a solution of equation $x+4=2$.

4. **(a) Complete the table and by inspection of the table, find the solution to the equation $m+10=16$.**

m	1	2	3	4	5	6	7	8	9	10	–	–	–
$m+10$	–	–	–	–	–	–	–	–	–	–	–	–	–

(b) Complete the table and by inspection of the table, find the solution to the equation $5t=35$.

t	3	4	5	6	7	8	9	10	11	–	–	–	–	–
$5t$	–	–	–	–	–	–	–	–	–	–	–	–	–	–

(c) Complete the table and find the solution of the equation z/3 = 4 using the table.

z	8	9	10	11	12	13	14	15	16	–	–	–	–
$\frac{z}{3}$	$2\frac{2}{3}$	3	$3\frac{1}{3}$	–	–	–	–	–	–	–	–	–	–

(d) Complete the table and find the solution to the equation $m-7=3$.

m	5	6	7	8	9	10	11	12	13	–	–
$m-7$	–	–	–	–	–	–	–	–	–	–	–

Sol. (a) The complete table is shown below

m	$m+10$
1	$1+10=11$
2	$2+10=12$
3	$3+10=13$
4	$4+10=14$
5	$5+10=15$
6	$6+10=16$
7	$7+10=17$
8	$8+10=18$
9	$9+10=19$
10	$10+10=20$
11	$11+10=21$
12	$12+10=22$
13	$13+10=23$

By inspection of the above table, we see that $m=6$ satisfies the equation $m+10=16$.
[$\because$ at $m=6$, LHS = RHS]
Hence, $m=6$ is its solution.
(b) The complete table is shown below

t	$5t$
3	$5\times3=15$
4	$5\times4=20$
5	$5\times5=25$
6	$5\times6=30$

7	$5\times7=35$
8	$5\times8=40$
9	$5\times9=45$
10	$5\times10=50$
11	$5\times11=55$
12	$5\times12=60$
13	$5\times13=65$
14	$5\times14=70$
15	$5\times15=75$
16	$5\times16=80$

By inspection of the above table, we find that $t=7$ satisfies the equation $5t=35$.
[$\because$ at $t=7$, LHS = RHS]
Hence, $t=7$ is its solution.
(c) The complete table is shown below.

z	$\frac{z}{3}$
8	$\frac{8}{3}=2\frac{2}{3}$
9	$\frac{9}{3}=3$
10	$\frac{10}{3}=3\frac{1}{3}$
11	$\frac{11}{3}=3\frac{2}{3}$
12	$\frac{12}{3}=4$
13	$\frac{13}{3}=4\frac{1}{3}$
14	$\frac{14}{3}=4\frac{2}{3}$
15	$\frac{15}{3}=5$
16	$\frac{16}{3}=5\frac{1}{3}$
17	$\frac{17}{3}=5\frac{2}{3}$
18	$\frac{18}{3}=6$
19	$\frac{19}{3}=6\frac{1}{3}$
20	$\frac{20}{3}=6\frac{2}{3}$

By inspection of the above table, we find that $t = 12$ satisfies the equation $\frac{z}{3} = 4$. [$\because$ at $t = 12$, LHS = EHS]

Hence, $z = 12$ is its solution.

(d) The complete table is shown below

m	$m-7$
5	$5-7=-2$
6	$6-7=-1$
7	$7-7=0$
8	$8-7=1$
9	$9-7=2$
10	$10-7=3$
11	$11-7=4$
12	$12-7=5$
13	$13-7=6$
14	$14-7=7$
15	$15-7=8$

By inspection of the above table, we find that $m = 10$ satisfies the equation $m-7=3$.

[$\because$ at $m = 10$, LHS = RHS]

Hence, $m = 10$ is its solution.

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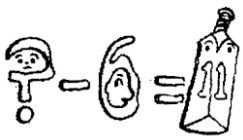
5. Solve the following riddles, you may yourself constructsuch riddles.

Who am I?

(i) Go round a square
Counting every corner
Thrice and no more!
Add the count to me
To get exactly thirty four!

(ii) For each day of the week
make an up count from me
If you make no mistake
You will get twenty three!



(iii) I am a special number

Take away from me a six!
A whole cricket team
You will still be able to fix!
(iv) Tell me who I am
I shall give a pretty clue!
You will get me back
If you take me out of twenty two!

Sol. (i) Let I be denoted by x.
We know that a square has 4 corners and each corner is countedthrice.
Total number of comers $=4\times3=12$
By given condition, my self+ total number of corners $x+12=34$
Now, $x=34-12=22 \Rightarrow x=22$
By inspection, we have $22+12=34$
Thus, I am 22.
(ii) Let I be denoted by x. There are 7 days in a week.
By given condition upcounting from x for 7, we get the sum = 23
i.e. $x+7=23$
Now, $x=23-7=16 \Rightarrow x=16$
By inspection, we have $16+7=23$
Thus, I am 16.
(iii) Let the special number $=x$
Then, as per given condition take away 6 from $x=$ whole cricket team i.e.
$x-6=11$
In cricket team, number of players =11
Now, $x=11+6=17 \Rightarrow x=17$
By inspection, we have $17-6=11$
Thus, the special number is 17.
(iv) Let I be denoted by x.
By given condition, take x out of $22=x$
$\Rightarrow \quad 22-x=x \quad \Rightarrow x+x=22$
$\Rightarrow \quad 2x=22 \quad \Rightarrow x=11$
By inspection, we have $2\times11=22$
Thus, I am 11.

NCERT Exemplar (Problems-Solutions)

Directions In questions 1 to 10, out of the four options, only one is correct. Write the correct answer.

1. **If each match box contains 50matchsticks, the number of matchsticks required to fill *n* such boxes is**

(a) $50+n$ **(b)** $50n$

(c) $50\div n$ **(d)** $50-n$

Sol. $\because$ One match box contains 50 matchsticks,

Then, required matchsticks to nil match box $=50\times n=50n$

Hence, option (b) is correct answer.

2. **Amulya is $x\,yr$ of age now. $5\,yr$ ago her age was**

(a) $(5-x)yr$ **(b)** $(5+x)yr$

(c) $(x-5)yr$ **(d)** $(5\div x)yr$

Sol. Amulya's age now $=xyr$

$\therefore 5yr$ ago her age was $=(x-5)\,yr$

[$\because$ 5 yr ago age was given by subtracting age now to 5 yr ago age]

Hence, option (c) is correct answer.

3. **In algebra, *a b* means *ab*, but in arithmetic 35 is**

(a) 35 **(b) 53**

(c) 15 **(d) 8**

Sol. By algebra, *a b* means *ab*

[multiplying *a* by *b* is *ab*]

By multiplication rule in arithmetic,

$35=3\times5$ [here, *a* = 3 and *b* = 5, then applying *a b*= *ab*]

= 15

Hence, option (c) is correct answer.

4. **Which of the following equation has $x=2$ as a solution?**

(a) $a+2=5$ **(b)** $a-2=0$

(c) $2x+1=0$ **(d)** $x+3=6$

Sol. To get solution as $x=2$, solve each equation

(a) $x+2=5 \Rightarrow x=5-2=3$

(b) $x-2=0 \Rightarrow x=0+2 \Rightarrow x=2$

(c) $2x+1=0 \Rightarrow 2x=-1 \Rightarrow x=-\frac{1}{2}$

(d) $x+3=6 \Rightarrow x=6-3=3$

Therefore, we get $x=2$ in option (b).

Hence, option (b) is correct answer.

5. **Savitri has a sum of ₹ x. She spent ₹ 1000 on grocery, ₹ 500 on clothes and ₹ 400 on education, and received ₹ 200 as a gift. How much money (in ₹) is left with her?**

(a) $x-1700$ **(b)** $x-1900$

(c) $x+200$ **(d)** $x-2100$

Sol. Savitri has a total sum =₹ x

Total money spents = [Grocery + Clothes + Education]

= ₹ (1000 + 500 + 400) = ₹ 1900

After that she received a gift = ₹ 200

Then, money left with her = [Sum of money + Received gift total spent money]

$=(x+200-1900)$

$=(x-1700)$

Hence, option (a) is correct answer.

6. **If the perimeter of a regular hexagon is x m, then the length of each of its sides is**

(a) $(x+6)m$ **(b)** $(x\div 6)m$

(c) $(x-6)m$ **(d)** $(6\div x)m$

Sol. Given, perimeter of regular hexagon $=x$ m

Sides in a regular hexagon $=6$

$\because$ Perimeter of regular hexagon $=6\times$ Each side of regular hexagon i.e. $x=6\times$ Each side of regular hexagon

$\therefore$ Each side of regular hexagon $=\frac{x}{6}$ or $x\div 6$

Hence, option (b) is correct answer.

7. $\frac{4}{2}$ **denotes a**

(a) numerical equation

(b) algebraic expression

(c) equation with a variable

(d) false statement

Sol. $\frac{4}{2}=2$ denotes a numerical equation,

Hence, option (a) is correct.

8. **I think of a number and on adding 13 to it, I get 27. The equation for this is**

(a) $x-27=13$ **(b)** $x-13=27$

(c) $x+27=13$ **(d)** $x+13=27$

Sol. Let the number be x.

According to the question,

13 is added to the number $=x+13$

After adding that equation is equals to 27.

Hence, $x+13=27$

Hence, option (d) is correct answer.

9. **Kanta has *p* pencils in her box. She puts *q* more pencils in the box. The total number of pencils with her are**

(a) $p+q$ **(b)** pq

(c) $p-q$ **(d)** $\frac{p}{q}$

Sol. Given,

Kanta's box has pencils $=p$

Then, she puts some pencils in the box $=q$

Hence, total number of pencils in the box will be given by adding property = [before putting pencil + after putting pencils] $=p+q$

Hence, option (a) is correct answer.

10. The two digit number whose ten's digit is 't' and units's digit is 'u' is ____.

Sol. Given, unit place digit $=u$ and ten's place digit $=t$

So, the two digit number $=10t+4$

11. $x=5$ is the solution of the equation $3x+2=20$ is true or false?

Sol. Given equation, $3x+2=20 \Rightarrow 3x=20-2$

$3x=18 \Rightarrow x=\frac{18}{3}$ [by deviation rule]

$x=6$

Hence, solution of x is false.

12. The equations $x+1=0$ and $2x+2=0$ have the same solution is true or false.

Sol. For getting answer, we have to solve both equations.

Given, equations are $x+1=0$ and $2x+2=0$

$x+1=0 \Rightarrow x=-1$ [by transposing rule]

and $2x+2=0 \Rightarrow 2x=-2$ [by transposing rule]

$x=-\frac{2}{2}=-1$ [by dividation rule]

Hence, it is true that both equations have same solution.

13. The additive inverse of an integer x is $2x$ is true or false.

Sol. Given, integer $=x$

Let 2 is added to the given integer

Then, the expression $=x+2$

But in equation additive property gives $2x$.

Hence, the equation is false.

14. One third of a number added to itself gives 8, can be pressed as $\frac{x}{3}+8=x$ is true or false.

Sol. Let the number be x

According to the question,

One-third of the number $=\frac{x}{3}$

After that it is added to itself, i.e. $x+\frac{x}{3}$

And this equation is equal to 8.

Hence, the equation is $x+\frac{x}{3}=8$

But the given equation is $\frac{x}{3}+8=x$

So, the given equation is false.

15. **One more than twice the number. Give corresponding expression.**

Sol. Let the number be x.

Twice of the number $=2x$ [given]

After that, $2x$ is add by 1 to get another number, which is more than that number.

Then, expression $=2x+1$

16. **Area of the rectangle with length k units and breadth n units. Give corresponding expressions.**

Sol. Given, the length of rectangle $=k$ units and breadth of the rectangle $=n$ units

$\because$ Area of the rectangle = Length $\times$ Breadth $=k\times n=kn$

Hence, the expression is kn.

17. **Write two equations for which 2 is the solution. Give corresponding expressions.**

Sol. Let the two numbers be x and y, which has solution 2 in equation.

(i) For getting first equation, the number x is multiplied by 2, then the number is $2x$. After that it, 3 is subtracted from it which results into 1.

Hence, we have $2x-3=1$

On solving $2x=3+1\Rightarrow 2x=4\Rightarrow x=2$

(ii) For getting second equation, the number y is multiplied by 3, then the number is $3y$. After that it will be added by 4 and equal to 10.

Hence, we have, $3y+4=10$

On solving, $3y=10-4\Rightarrow 3y=6\Rightarrow y=2$

Hence, both equations are $2x-3=1$ and $3y+4=10$.

18. **On my last birthday. I weighed 40 kg. If I put on m kg of weight after a year, what is my present weight?**

Sol. According to the question,

Weight on last birthday $=40\,kg$

After a year, putting weight $=m$ kg

Then, present weight = [weight on last birthday + after a year weight]

$=(40+m)\,kg$

19. **If m is a whole number less than 5, complete the table and by inspection of the table, find the solution of the equation $2m-5=-1$**

m					
$2m-5$					

Sol. Given, m is a whole number which is less than 5, then solution of the equation is given by putting value of m in the table.

When $m=0$, $2m-5=2(0)-5=-5\Rightarrow m=-5$

When $m=1$ $2m-5=2(1)-5=2-5=-3\Rightarrow m=-3$

When $m=2$,

$2m-5=2(2)-5=4-5=-1 \Rightarrow m=-1$

When $m=3$,

$2m-5,=2\times(3)-5=6-5-1 \Rightarrow m=1$

When $m=4$, $2m-5, 2\times4-5=8-5 \Rightarrow m=3$

m	0	1	2	3	4
$2m-5$	–5	–3	–1	1	3

Hence, solution of the equation is given by $m=2$.

20. What is the area of a square, whose side is $m\ cm$?

Sol. Given, side of the square $=m\ cm$

$\therefore$ Area of square = Side $\times$ Side

$=m\times m=m^2 sqcm$

21. A class with p students has planned a picnic. ₹ 50 per student is collected, out of which ₹ 1800 is paid in advance for transport. How much money is left with them to spend on other items?

Sol. According to the question,

Total students in the class $=p$

Collected money from per student = ₹ 50

Then, total money collected = ₹ 50*p*

Advance paid for transport = ₹ 1800 [given]

$\therefore$ Left money for spend on other items

= [Total money collected – Advance paid money] ₹= (50*p*– 1800)

22. In a village, there are 8 water tanks to collect rainwater. On a particular day, $x\,L$ of rain water is collected per tank. If 100 L of water was already there in one of the tanks, what is the total amount of water in the tanks on that day?

Sol. According to the question,

Tanks to collect rain water = 8

Rain water is collected per tank (in L) $=x$

Then, total rain water in tanks (in L)

= Number of tanks $\times$ Per tank collected rain water $=8\times x=8x$

But in the one tank, already 100 L of water exist, then

Total amount of water is given by = 100 + [total rain water in L]

$=100+8x$ or $8x+100\,L$

23. Sunita is half the age of her mother Geeta. Find their ages
(i) after $4\ yr$? (ii) before $4\ yr$?

Sol. Let the age of Sunita's mother $=2xyr$

Then, according to the question

Geeta age $=\frac{2x}{2}=x$

[half of her mother's age]

(i) Since, in the after years, present age is added in given years.

$\therefore$ Sunita's age $=(x+4)yr$

Her mother's age $=(2x+4)$

(ii) Since, in the before years, given year is subtracted from presentage.

$\therefore$ Sunita's age $=(x-3)\,yr$ and har mother's age $=(2x-3)yr$

24. Perimeter of a triangle is found by using the formula $P=a+b+c$, where *a*, *b* and *c* are the sides of the triangle.

Write the rule that is expressed by this formula in words.

Sol. In this question, given formula for getting perimeter of triangle is $P=a+b+c$

Here *a*, *b* and *c* are sides of the triangle.

Hence, the perimeter of the triangle is given by the sum of sides of triangle.

25. Match the items of Column I with that of Column II.

Column I	Column II
(i) The number of corners, of a quadrilateral	(A) =
(ii) The variable in the equation $2p+3=5$	(B) constant
(iii) The solution of the equation $x+2=3$	(C) + 1
(iv) Solution of the equation $2p+3=5$	(D) – 1
(v) A sign used in an equation	(E) p
	(F) x

Sol. (i) In a quadrilateral, numbers of corners are constant $\therefore (i)\rightarrow(B)$

(ii) In the equation $2p+3=5$

p is variable. $\therefore$ (ii) $\rightarrow(E)$

(iii) Given equation, $x+2=3$

For solving equation use transposing rule, $x+2=3$

$x=3-2\Rightarrow x=1$

On solving equation, we get $x=1$,

$\therefore (iii)\rightarrow(C)$

(iv) Given equation, $2p+3=5$

For solving equation use transposing rule,

$2p+3=5$

$2p=5-3,\Rightarrow 2p=2\Rightarrow p=1$

On solving equation, we get $p=1$,

$\therefore$ (iv) $\rightarrow$ (C)

(v) The sign used for equation is (=).

e.g. $2x+y=3,\ \therefore (v)\rightarrow(A)$