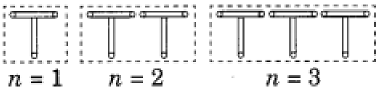
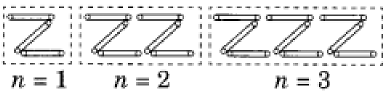
NCERT Solutions For Class 6 Maths Chapter 11 Algebra Ex 11.1

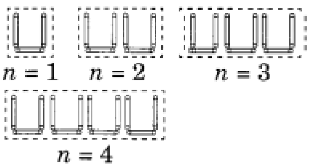
Exercise 11.1

Ex 11.1 Class 6 Maths Question 1.
Find the rule which gives the number of matchsticks required to make the following matchsticks 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
Solution:
(a)


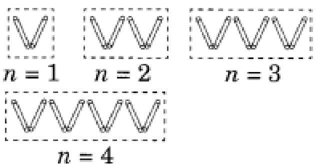
Number of matchstieks required to make the pattern of T
For n = 1 is 2 x n
For n = 2 is 2 x n
For n = 3 is x n
∴ Rule is 2n where n is number of Ts.

(b)


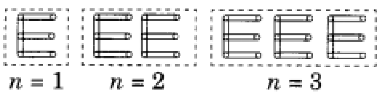
Number of matchstieks required to make the pattern of Z.
For n = 1 is 3 x n
For n = 2 is 3 x n
For n = 3 is 3 x n
∴ Rule is 3n where n is number of Zs.

(c)


Number of matchstieks required to make the pattern U.
For n = 1 is 3 x n
For n = 2 is 3 x n
For n = 3 is 3 x n
For n = 4 is 3 x n
∴ Rule is 3n where n is number of Us.

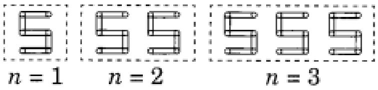
(d)


Number of matchstieks required
For n = 1 is 2 x n
For n = 2 is 2 x n
For n = 3 is 2 x n
For n = 4 is 2 x n
∴ Rule is 2n where n is number of Vs.

(e)


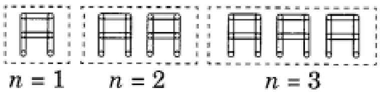
Number of matchstieks required
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is number of Es.

(f)



Number of matchstieks required
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is number of Ss.

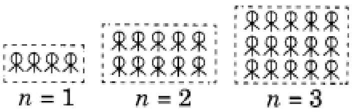
(g)



Number of matchstieks required
For n = 1 is 6 x n
For n = 2 is 6 x n
For n = 3 is 6 x n
∴ Rule is 6n where n is number of As.

Ex 11.1 Class 6 Maths Question 2.
We already know the rule for the pattern of letters L, C and F. Some of the letters from Ql. (given above) give us the same rule as that given by L. Which are these? Why does this happen?
Solution:
Rule for the following letters
For L it is 2n
For C it is 2n
For V it is 2n
For F it is 3n
For T it is 3n
For U it is 3n
We observe that the rule is same of L, V and T as they required only 2 matchstieks.
Letters C, F and U have the same rule, i.e., 3n as they require only 3 sticks.

Ex 11.1 Class 6 Maths Question 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.)
Solution:
Number of cadets in a row = 5
Number of rows = n



Number of cadets
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is the number of rows.

Ex 11.1 Class 6 Maths Question 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.)
Solution:
Number of boxes = b
Number of mangoes in a box = 50
Number of mangoes,
For n = 1 is 50 x b
For n = 2 is 50 x b
For n = 3 is 50 x b
∴ Rule is 50b where b represents the number of boxes.

Ex 11.1 Class 6 Maths Question 5.
The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students.)
Solution:
Number of students = s
Number of pencils distributed per students = 5
Number of pencils required
For n = 1 is 5 x s
For n = 2 is 5 x s

For n = 3 is 5 x s
∴ Rule is 5s where s represents the number of students.

Ex 11.1 Class 6 Maths Question 6.
A bird flies 1 kilometre in one minute. Can you express the distance covered by the bird in terms of is flying time in minutes? (Use t for flying time in minutes.)
Solution:
Distance covered in 1 minute = 1 km.
The flying time = t
Distance covered
For n = 1 is 1 x t km
For n = 2 is 1 x t km
For n = 3 is 1 x t km
∴ Rule is 1.t km where t represents the flying time.

Ex 11.1 Class 6 Maths Question 7.
Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder. She has a 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?
Solution:
Number of rows = r
Number of dots in a row drawn by Radha = 8
∴ The number of dots required
For r = 1 is 8 x r
For r = 2 is 8 x r
For r = 3 is 8 x r
∴ Rule is 8r where r represents the number of rows.
For r = 8, the number of dots = 8 x 8 = 64
For r = 10, the number of dots = 8 x 10 = 80

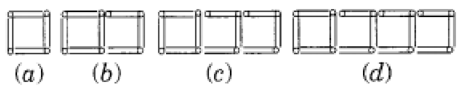
Ex 11.1 Class 6 Maths Question 8.

Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms of Radha's age? Take Radha's age to be x years.
Solution:
Radha's age = x yeas.
Given that Leela's age
= Radha's age – 4 years
= x years – 4 years
= (x – 4) years

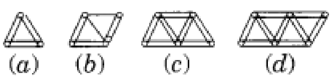
Ex 11.1 Class 6 Maths Question 9.
Mother has made laddus. She gives some laddus to guests and family members, still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?
Solution:
Given that the number of laddus given away = l
Number of laddus left = 5
∴ Number of laddus made by mother = l + 5

Ex 11.1 Class 6 Maths Question 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?
Solution:
Given that, the number of oranges in smaller box = x
∴ Number of oranges in bigger box = 2(number of oranges in small box) + (Number of oranges remain outside)
So, the number of oranges in bigger box = 2x + 10

Ex 11.1 Class 6 Maths Question 11.
(a) Look at the following matchstick pattern of square. The squares are not separate. Two neighbouring 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)



(b) Following figure 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.



Solution:

(a) Let n be the number of squares.
∴ Number of matchsticks required
For n = 1 is 3 x n + 1 = 3n + 1 = 4
For n = 2is 3 x n + 1 = 3n + 1 = 7
For n = 3is 3 x n + 1 = 3n + 1 = 10
For n = 4is 3 x n + 1 = 3n + 1 = 13
∴ Rule is 3n + 1 where n represents the number of squares.

(b) Let n be the number of triangles.
∴ Number of matchsticks required
For n = 1 is 2n + 1 = 3
For n = 2 is 2n + 1 = 5
For n = 3 is 2n + 1 = 7
For n = 4 is 2n + 1 = 9
∴ Rule is 2n + 1 where n represents the number of matchsticks.

Exercise 11.1

Question 1:

Find the rule which gives the number of matchsticks 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**

Answer:

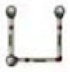
(a)

From the figure, it can be observed that it will require two matchsticks to make a **T**. Therefore, the pattern is $2n$.

(b)

From the figure, it can be observed that it will require three matchsticks to make a **Z**. Therefore, the pattern is $3n$.

(c)



From the figure, it can be observed that it will require three matchsticks to make a **U**. Therefore, the pattern is 3n.

(d)

From the figure, it can be observed that it will require two matchsticks to make a **V**. Therefore, the pattern is 2n.

(e)

From the figure, it can be observed that it will require five matchsticks to make an **E**. Therefore, the pattern is 5n.

(f)

From the figure, it can be observed that it will require five matchsticks to make a **S**. Therefore, the pattern is 5n.

(g)

From the figure, it can be observed that it will require six matchsticks to make an **A**. Therefore, the pattern is 6n.

Question 2:

We already know the rule for the pattern of letters L, C and F. Some of the letters from some of the letters out of (a) T, (b) Z, (c) U, (d) V, (e) E, (f) S, (g) R give us the same rule as that given by L. Which are these? Why does this happen?

Answer:

It is known that L requires only two matchsticks. Therefore, the pattern for L is 2n. Among all the letters given above in question 1, only T and V are the two letters which require two matchsticks.

Hence, (a) and (d)

Question 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.)

Answer:

Let number of rows be n.

Number of cadets in one row = 5

Total number of cadets = Number of cadets in a row × Number of rows

= 5n

Question 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.)

Answer:

Let the number of boxes be b.

Number of mangoes in a box = 50

Total number of mangoes = Number of mangoes in a box × Number of boxes

= $50b$

Question 5:

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

Answer:

Let the number of students be s.

Pencils given to each student = 5

Total number of pencils

= Number of pencils given to each student × Number of students

= $5s$

Question 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.)

Answer:

Let the flying time be t minutes.

Distance covered in one minute = 1 km

Distance covered in t minutes = Distance covered in one minute × Flying time

= $1 \times t = t$ km

Question 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?

Answer:

Number of dots in 1 row = 9

Number of rows = r

Total number of dots in r rows = Number of rows × Number of dots in a row

= $9r$

Number of dots in 8 rows = $8 \times 9 = 72$

Number of dots in 10 rows = $10 \times 9 = 90$

Question 8:

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

Answer:

Let Radha's age be x years.

Leela's age = Radha's age − 4

= $(x - 4)$ years

Question 9:

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

Answer:

Number of laddus given away = l

Number of laddus remaining = 5

Total number of laddus = Number of laddus given away + Number of laddus remaining

= $l + 5$

Question 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?

Answer:

Number of oranges in one small box = x

Number of oranges in two small boxes = $2x$

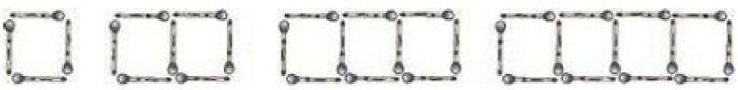
Number of oranges left = 10

Number of oranges in the large box = Number of oranges in two small boxes + Number of oranges left

= $2x + 10$

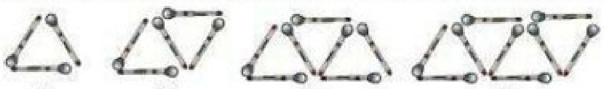
Question 11:

(a) Look at the following matchstick pattern of squares. The squares are not separate. Two neighbouring 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.)



(a) (b) (c) (d)

(b) The given figure gives a matchstick pattern of triangles. Find the general rule that gives the number of matchsticks in terms of the number of triangles.



(a) (b) (c) (d)

Answer:

(a) It can be observed that in the given matchstick pattern, the number of matchsticks are 4, 7, 10, and 13, which is 1 more than thrice of the number of squares in the pattern.

Hence, the pattern is $3n + 1$, where n is the number of squares.

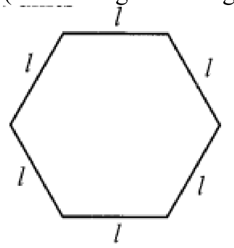
(b) It can be observed that in the given matchstick pattern, the number of matchsticks are 3, 5, 7, and 9, which is 1 more than twice of the number of triangles in the pattern.

Hence, the pattern is $2n + 1$, where n is the number of triangles.

Exercise 11.2

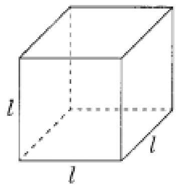
Ex 11.2 Class 6 Maths Question 1.
The side of an equilateral triangle is shown by l. Express the perimeter of the equilateral triangle using l.
Solution:
Given that the side of an equilateral triangle = l
Perimeter of the equilateral triangle = 3 x side = 3 x l = 3 l units

Ex 11.2 Class 6 Maths Question 2.
The side of a regular hexagon (See figure) is denoted by l. Express the perimeter of the hexagon using l.
(Hint: A regular hexagon has all its six sides equal in length)



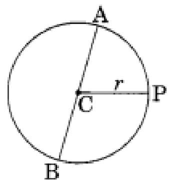
Solution:
Given that each side of a hexagon = l
∴ Perimeter of the regular hexagon = l + l + l + l + l + l
= 6 x l = 6 l units

Ex 11.2 Class 6 Maths Question 3.
A cube is a three-dimensional figure as shown in (see 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.



Solution:
We know that a cube has 12 edges and 6 identical faces.
Since all edges are of equal length.
∴ Total length of the edges = 12 x l = 12 l units
∴ Required formula = 12 l units

Ex 11.2 Class 6 Maths Question 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 adjoining figure AB is a diameter of the circle; C is its centre). Express the diameter of the circle (d) in terms of its radius (r).



Solution:
Given that radius = r and diameter = d
∴ Diameter = 2 x radius = 2 x r = 2r
So, diameter = 2r.

Ex 11.2 Class 6 Maths Question 5.
To find sum of three numbers 14, 27 and 13, we can have two ways;
(a) We may first add 14 and 27 to get 41 and then add 13 to it to get the total sum 54 or
(b) We may add 27 and 13 to get 13 to get 40 and then add 14 to get the sum 54.
Thus, (14 + 27) + 13 = 14 + (27 + 13)
This can be done for any three numbers. This property is known as the associativity of addition of numbers. Express this property which we have already studied in the chapter on whole numbers, in a general way, by using a, b, and c.
Solution:
Given three numbers are a, b and c.
Associative property of addition of numbers = (a + b) + c = a + (b + c)

Question 1:

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

Answer:

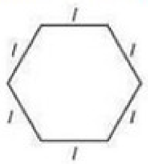
Side of equilateral triangle = *l*

Perimeter = *l* + *l* + *l* = 3*l*

Question 2:

The Side of a regular hexagon (see the given figure) is denoted by *l*. Express the perimeter of the hexagon using *l*.

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



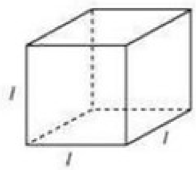
Answer:

Side of regular hexagon = *l*

Perimeter = 6*l*

Question 3:

A cube is a three-dimensional figure as shown in the given 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.



Answer:

Length of edge = *l*

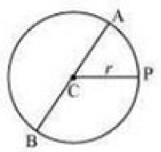
Number of edges = 12

Total length of the edges = Number of edges × Length of one edge

= 12*l*

Question 4:

The diameter of a circle is a line which joins two points on the circle and also passed through the centre of the circle. (In the adjoining figure AB is a diameter of the circle; C is its centre.) Express the diameter of the circle (*d*) in terms of its radius(*r*).



NCERT Solutions For Class 6 Maths Chapter 11 Algebra Ex 11.3

Exercise 11.3

Ex 11.3 Class 6 Maths Question 1.
Make up as many expressions with numbers (no variables) as you can from three numbers 5, 7 and 8. Every number should be used not more than once. Use only addition, subtractions and multiplication.
Solution:
Given numbers are 5, 7 and 8.
Expressions are:
(i) 8 + (5 + 7)
(ii) 5 + (8 – 7)
(iii) 8 + (5 x 7)
(iv) 7 – (8 – 5)
(v) 7 x (8 + 5)
(vi) 5 x (8 + 7)
(vii) 8 x (5 + 7)
(viii) 7 + (8 – 5)

(ix) (5 x 7) – 8
(x) 7 + (8 x 5)

Ex 11.3 Class 6 Maths Question 2.
Which out of the following are expressions with numbers only?
(a) y + 3
(b) (7 x 20) – 8z
(c) 5(21 – 7) + 7 x 2
(d) 5
(e) 3x
(f) 5 – 5n
(g) (7 x 20) – (5 x 10) – 45 +p
Solution:
(a) y + 3. This expression has variable 'y'.
(b) (7 x 20) – 8z. This expression has a variable 'z'.
(c) 5(21 -7) + 7 x 2. This expression has no variable. So it is with numbers only.
(d) 5. This expression is with numbers only.
(e) 3x. This expression has a variable 'x'.
(f) 5 – 5n. This expression has a variable 'n'.
(g) (7 x 20) – (5 x 10) – 45 + p. This expression has a variable 'p'.

Ex 11.3 Class 6 Maths Question 3.
Identify the operations (addition, subtraction, division and multiplication) in forming the following expressions and tell how 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
Solution:

Expressions			Operations used	Formation of expression
(a)	(i)	z + 1	Addition	z is increased by 1
	(ii)	z – 1	Subtraction	z is decreased by 1
	(iii)	y +17	Addition	y is increased by 17
	(iv)	y -17	Subtraction	y is decreased by 17
(b)	(i)	17y	Multiplication	y is multiplied by 17
	(ii)	y/17	Division	y is Divided by 17
	(iii)	5z	Multiplication	z is Multiplied by 5
(c)	(i)	2y + 17	Multiplication and addition	y is multiplied by 2 and then 17 is added.
	(ii)	2y -17	Multiplication and subtraction	Twice of y is decreased by 17
(d)	(i)	7 m	Multiplication	m is multiplied by 7
	(ii)-	-7m + 3	Multiplication and addition	m is multiplied by -7 and then increased by 3
	(iii)	-7m – 3	Multiplication and subtraction	M is multiplied by -7 and then decreased by 3

Ex 11.3 Class 6 Maths Question 4.
Give expressions for the follow
(a) 7 added top
(b) 7 subtracted from p
(c) p multiplied by 7
(d) p divided by 7
(e) 7 subtracted from -m
(j) -p multiplied by 5
(g) -p divided by 5
(h) p multiplied by -5
Solution:
(a) p + 7
(b) p – 7
(c) 7p
(d) $\frac{p}{7}$
(e) -m – 7
(f) -5p

(g) $\frac{-p}{5}$
(h) 5p

Ex 11.3 Class 6 Maths Question 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.
Solution:
(a) $2m + 11$
(b) $2m - 11$
(e) $5y + 3$
(d) $5y - 3$
(e) $-8y$
(f) $-8y+5$
(g) $16 - 5y$
(h) $-5y + 16$

Ex 11.3 Class 6 Maths Question 6.
(a) Form expressions using t and 4. Use not more than one number operation. Every expression must have t in it.
(b) Form expressions using y, 2 and 7. Every expression must have y in it. Use only two number operations. These should, be different.
Solution:
(a) The possible expressions are:
(i) $t + 4$
(ii) $t - 4$
(iii) $4t$
(iv) $\frac{t}{4}$
(v) $4 + t$
(vi) $4 + t$,etc.

(b) The possible expressions are:
(i) $2y + 7$
(ii) $7y - 2$
(iii) $7 - 2y$
(iv) $7y + 2$
(v) $\frac{7y}{2}$
(vi) $\frac{2y}{7}$
(vii) $\frac{y}{7} + 2$
(viii) $\frac{y}{2} - 7$,etc.

Question 1:

Make up as many expressions with numbers (no variables) as you can from three numbers 5, 7 and 8. Every number should be used not more than once. Use only addition, subtraction and multiplication.

(Hint: Three possible expressions are $5 + (8 - 7)$, $5 - (8 - 7)$, $(5 \times 8) + 7$; make the other expressions.)

Answer:

Many expressions can be formed by using the three numbers 5, 7, and 8.

Some of these are as follows.

$5 \times (8 - 7)$

$5 \times (8 + 7)$

$(8 + 5) \times 7$

$(8 - 5) \times 7$

$(7 + 5) \times 8$

$(7 - 5) \times 8$

Question 2:

Which out of the following are expressions with numbers only?

(a) $y + 3$ (b) $(7 \times 20) - 8z$

(c) $5\ (21 - 7) + 7 \times 2$ (d) 5

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

(g) $(7 \times 20) - (5 \times 10) - 45 + p$

Answer:

It can be observed that the expressions in alternatives (c) and (d) are formed by using numbers only.

Question 3:

Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how 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) $7m$, $-7m + 3$, $-7m - 3$

Answer:

(a) Addition as 1 is added to z.

Subtraction as 1 is subtracted from z.

Addition as 17 is added to y.

Subtraction as 17 is subtracted from y.

(b) Multiplication as y is multiplied with 17.

Division as y is divided by 17.

Multiplication as z is multiplied with 5.

(c) Multiplication and addition

y is multiplied with 2, and 17 is added to the result.

Multiplication and subtraction

y is multiplied with 2, and 17 is subtracted from the result.

(d) Multiplication as m is multiplied with 7.

Multiplication and addition as m is multiplied with -7, and 3 is added to the result.

Multiplication and subtractionas m is multiplied by -7, and 3 is subtracted from the result.

Question 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

Answer:

(a) $p + 7$

(b) $p - 7$

(c) $7p$

(d) $\frac{p}{7}$

(e) $-m - 7$

(f) $-5p$

(g) $\frac{-p}{5}$

(h) $-5p$

Question 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

Answer:

(a) $2m + 11$

(b) $2m - 11$

(c) $5y + 3$

(d) $5y - 3$

(e) $-8y$

(f) $-8y + 5$

(g) $16 - 5y$

(h) $-5y + 16$

Question 6:

(a) Form expressions using t and 4. Use not more than one number operation. Every expression must have t in it.

(b) Form expressions using y, 2 and 7. Every expression must have y in it. Use only two number operations. These should be different.

Answer:

(a) $t + 4$, $t - 4$, $4t$, $\frac{t}{4}$, $\frac{4}{t}$, $4 - t$, $4 + t$

(b) $2y + 7$, $2y - 7$, $7y + 2$,...

NCERT Solutions For Class 6 Maths Chapter 11 Algebra Ex 11.4

Exercise 11.4

Ex 11.4 Class 6 Maths Question 1.
Answer the following:
(a) Take Sarita's present age to bey 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 is 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 times Sarita's age. What is her father's age?
(b) The length of a rectangular hall is 4 metres less than 3 times the breadth of the hall. What is the length, if the breadth is b metres?
(c) A rectangular box has height h cm. Its length is 5 times the height and breadth is 10 cm less than the length. Express the length and the breadth of the box in terms of the height.
(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.
(e) A bus travels at v 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.
Solution:
(a) Sarita's age is given y years.
(i) After 5 years from now, her age will be (y + 5) years.
(ii) 3 years back from now, she was (y – 3) years of age.
(iii) Age of her grandfather = 6y years.
(iv) Age of her grandmother = (6y – 2) years.
(v) Sarita's father's age = (3y + 5) years.

(b) Let T be the length of the rectangular hall
∴ length = (3b – 4) metre
Where b represents the breadth.

(c) Height of the rectangular box is 'h'
∴ Length = 5h cm
and Breadth = (5h – 10) cm.

(d) Meena is at step s.
∴ Beena is at (s + 8) steps and Leena is at (s – 7) steps.
Total number of steps on to the hill top = (4s – 10)

(e) Distance travelled by Bus in 5 hours = 5v km.
∴ Distance from Daspur to Beespur = (5v + 20) km.

Ex 11.4 Class 6 Maths Question 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 – Nalin scores 15 runs more than Salim.
(a) A notebook costs ₹p. A book costs ₹3p.
(b) Tony puts q marbles on the table. He has 8q marbles in his box.
(c) Our class has n students. The school has 20n students.
(d) Jaggu is 2 years old. His uncle is 42 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.
Solution:
(a) A book costs 3 times the cost of a notebook.
(b) Tony has 8 times the number of marbles put on the table by him.
(c) The school has 20 times the number of students in a class.
(d) Jaggu's uncle's age is 4 times his age and his aunt's age is 3 years less than the age of his uncle.
(e) Number of dots in a row is 5 times the number of rows.

Ex 11.4 Class 6 Maths Question 3.
(a) Given Mannu's age to be x years, Can you guess what (x – 2) may show?
(Hint: Think of Mannu's younger brother) can you guess what (x + 4) may now? What (3x + 7) may show?
(b) Given Sara's age today to bey years. Think of her 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 $\frac{n}{2}$ show?
(Think of games other than football).
Solution:
(a) Given that Mannu's age = x years.
∴ (x -2) years may be the age of her younger brother or younger sister.
(x + 4) years show the age of her elder brother or elder sister.
(3x + 7) years may be the age of her father, mother or uncle.

(b) y represents the age of Sara in years.
∴ y + 7 shows her future age.
y – 3 shows her past age.
$y + 4\frac{1}{2}$ show her future age i.e., the age after z
four and half years.
$y - 2\frac{1}{2}$ shows her past age i.e., the age before two and half years.

(c) Number of students who like football = n
∴ 2n = twice the number of football players may like to play cricket.
and $\frac{n}{2}$ = half of the number of football 2
players may like to play basket ball.

Exercise 11.4

Question 1:

Answer the following:

(a) Take Sarita'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 is 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 times Sarita's age. What is her father's age?

(b) The length of a rectangular hall is 4 meters less than 3 times the breadth of the hall. What is the length, if the breadth is *b* meters?

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

(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*.

(e) A bus travels at *v* 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*.

Answer:

(a) (i) Sarita's age after 5 years from now = Sarita's present age + 5

$= y + 5$

(ii) 3 years ago, Sarita's age = Sarita's present age − 3

$= y - 3$

(iii) Grandfather's age = 6 × Sarita's present age = $6y$

(iv) Grandmother's age = Grandfather's present age − 2 = $6y - 2$

(v) Father's age = 5 + 3 × Sarita's present age = $5 + 3y$

(b) Length = 3 × Breadth − 4

$l = (3b - 4)$ metres

(c) Length = 5 × Height

$l = 5h$ cm

Breadth = 5 × Height − 10

$b = (5h - 10)$ cm

(d) Step at which Beena is = (Step at which Meena is) + 8

$= s + 8$

Step at which leena is = (Step at which Meena is) − 7

$= s - 7$

Total steps = 4 × (Step at which Meena is) − 10 = $4s - 10$

(e) Speed = v km/hr

Distance travelled in 5 hrs = $5 \times v = 5v$ km

Total distance between Daspur and Beespur = $(5v + 20)$ km

Question 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 – Nalin scores 15 runs more than Salim.)
(a) A note book costs Rs *p*. A book costs Rs 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 4 *z* 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.
Answer:
(a) A book costs three times the cost of a notebook.
(b) Tony's box contains 8 times the number of marbles on the table.
(c) Total number of students in the school is 20 times that of our class.
(d) Jaggu's uncle is 4 times older than Jaggu and Jaggu's aunt is 3 years younger than his uncle.
(e) The total number of dots is 5 times the number of rows.

Question 3:
(a) Given Munnu's age to be *x* years, can you guess what ($x - 2$) may show?
(Hint: Think of Mannu'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 of her 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 2*n* show? What may $\frac{n}{2}$ show?
(Hint: Think of games other than football).
Answer:
(a)($x - 2$) represents that the person, whose age is ($x - 2$) years, is 2 years younger to Munnu.
($x + 4$) represents that the person, whose age is ($x + 4$) years, is 4 years elder to Munnu.
($3x + 7$) represents that the person, whose age is ($3x + 7$) years, is elder to Munnu and his age is 7 years more than three times of the age of Munnu.
(b) **In future**
After *n* years from now, Sara's age will be ($y + n$) years.
In past
n years ago, Sara's age was ($y - n$) years.
($y + 7$) represents that the person, whose age is ($y + 7$) years, is 7 years elder to Sara.
($y - 3$) represents that the person, whose age is ($y - 3$) years, is 3 years younger to Sara.

($y + 4\frac{1}{2}$) represents that the person, whose age is ($y + 4\frac{1}{2}$) years, is $4\frac{1}{2}$ years elder to Sara.
($y - 2\frac{1}{2}$) represents that the person, whose age is ($y - 2\frac{1}{2}$) years, is $2\frac{1}{2}$ years younger to Sara.
(c) 2*n* may represent the number of students who like either football or some other game such as cricket whereas $\frac{n}{2}$ represents the number of students who like cricket, out of the total number of students who like football.

NCERT Solutions For Class 6 Maths Chapter 11 Algebra Ex 11.5

Exercise 11.5

Ex 11.5 Class 6 Maths Question 1.
State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from 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 x 2) + p
(k) 20 = 5y
(l) $\frac{3q}{2}$ < 5 (m) z + 12 > 24
(n) 20 – (10 – 5) = 3 x 5
(o) 7 – x = 5
Solution:
(a) 17 = x + 7 is an equation with a variable x.
(b) (t – 7) > 5 is not an equation because it does not have '=' sign.
(c) $\frac{4}{2}$ = 2 is not an equation because it has no variable.
(d) (7 x 3) – 19 = 8 is not an equation because it has no variable.
(e) 5 x 4 – 8 = 2x is an equation with a variable x.
(f) x – 2 = 0 is an equation with a variable x.
(g) 2m < 30 is not an equation because it does not have '=' sign.
(h) 2n + 1 = 11 is an equation with a variable n.
(i) 7 = (11 x 5) – (12 x 4) is not an equation because it does not have a variable.
(j) 7 = (11 x 2) + p is an equation with a variable p.
(k) 20 = 5y is an equation with a variable y.
(l) $\frac{3q}{2}$ < 5 is not an equation because it does not have '=' sign. (m) z + 12 > 24 is not an equation because it does not have '=' sign.
(n) 20 – (10 – 5) = 3 x 5 is not an equation because it has no variable.
(o) 7 – x = 5 is an equation with a variable x.

Ex 11.5 Class 6 Maths Question 2.
Complete the entries in the third column of the table.

S. No.	Equation	Value of variable	Equations 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	

Solution:

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

(i)	b + 5 = 9	b = 4	Yes
(J)	h – 8 = 5	h = 13	Yes
(k)	h – 8 = 5	h = 8	No
(l)	h – 8 = 5	h = 0	No
(m)	P + 3 = 1	p = 3	No
(n)	p + 3 = 1	p = 1	No
(o)	p + 3 = 1	p = 0	No
(P)	p + 3 = 1	p = -1	No
(q)	p + 3 = 1	p = -2	Yes

Ex 11.5 Class 6 Maths Question 3.
Pick out the solution from the values given in the brackets next to each equation. Show that the other values do not 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)
Solution:
(a) For m = 10, LHS = 5 x 10 = 50, RHS = 60
Here, LHS $\neq$ RHS
$\therefore$ m = 10 is not the solution of the equation
For m = 5, LHS = 5×5 = 25, RHS = 60
Here, LHS $\neq$ RHS
$\therefore$ m = 5 is not the solution of the equation
For m = 12, LHS = 5 x 12 = 60, RHS = 60
Here, LHS = RHS
$\therefore$ m = 12 is the solution of the equation
For m = 15 LHS = 5 x 15 = 75, RHS = 60
Here, LHS $\neq$ RHS
$\therefore$ m = 15 is not the solution of the equation

(b) n + 12 = 20 (12, 8, 20, 0)
For n = 12, LHS = 12 + 12 = 24, RHS = 20
Here, LHS $\neq$ RHS
$\therefore$ n = 12 is not the solution of the equation
For n = 8, LHS = 8 + 12 = 20, RHS = 20
Here, LHS = RHS
$\therefore$ n = 8 is the solution of the equation
For n = 20, LHS = 20 + 12 = 32, RHS = 20
Here, LHS $\neq$ RHS
$\therefore$ n = 20 is not the solution of the equation
For n = 0, LHS = 0 + 12 – 12, RHS = 20
Here, LHS $\neq$ RHS
$\therefore$ n= 0 is not the solution of the equation

(c) p – 5 = 5 (0, 10, 5, -5)
For p = 0, LHS = 0 – 5 = -5, RHS = 5
Here, LHS $\neq$ RHS
$\therefore$ p = 0 is not the solution of the equation
For p = 10, LHS = 10 – 5 = 5, RHS = 5
Here, LHS = RHS
$\therefore$ p = 10 is the solution of the equation
For p = 5, LHS = 5-5-0, RHS = 5
Here LHS $\neq$ RHS
$\therefore$ p = 5 is not the solution of the equation
For p = 5, LHS = 5 – 5 = 0, RHS = 5
Here, LHS $\neq$ RHS
$\therefore$ p = -5 is not the solution of the equation

(d) $\frac{q}{2}$ = 7 (7, 2, 10, 14)
For q = 7, LHS = $\frac{7}{2}$, RHS = 7
Here LHS $\neq$ RHS
$\therefore$ q = 7 is not the solution of the equation

For q = 2, LHS = $\frac{2}{2}$ = 1, RHS = 7
Here, LHS ≠ RHS
∴ q = 2 is not the solution of the equation
For q = 10, LHS = $\frac{10}{2}$ = 5, RHS = 7
Here, LHS ≠ RHS
For q = 14, LHS = $\frac{14}{2}$ = 7, RHS = 7
Here, LHS = RHS
∴ q = 14 is the solution of the equation

(e) r – 4 = 0 (4, -4, 8, 0)
For r = 4, LHS = 4 – 4 = 0, RHS = 0
Here, LHS = RHS
∴ r = 4 is the solution of the equation
For r = -4, LHS = -4 – 4 = -8, RHS = 0
Here, LHS ≠ RHS
∴ r = -4 is not the solution of the equation
For r = 8, LHS = 8 – 4 = 4, RHS = 0
Here, LHS ≠ RHS
For r = 8 is not the solution of the equation
For r = 0, LHS = 0 – 4 = – 4, RHS = 0
Here, LHS ≠ RHS
∴ r = 0 is not the solution of the equation

(f) x + 4 = 2 (-2, 0, 2, 4)
For x = -2, LHS = -2 + 4 = 2, RHS = 2
Here, LHS – RHS
∴ x = -2 is the solution of the equation
For x = 0, LHS = 0 + 4 – 4, RHS = 2
Here, LHS ≠ RHS
∴ x = 0 is not the solution of the equation
For x = – 2, LHS = -2 + 4 – 6, RHS = 2
Here, LHS ≠ RHS
∴ x = 2 is not the solution of the equation
For r = 4, LHS = 4 + 4 = 8, RHS = 2
Here, LHS ≠ RHS
∴ x = 4 is not the solution of the equation

Ex 11.5 Class 6 Maths Question 4.
(a) Complete the table and by inspection of the table find the solution to the equation m + 10 = 6

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 51 – 35

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

(c) Complete the table and find the solution of the equation g = 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
$m - 7$	–	–	–	–	–	–	–	–	–

Solution:
(a) By inspections, we have

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

So, m – 6 is the solution of the equation.

(b) Given that 5t = 35

t	3	4	5	6	7	8	9	10	11
$5t$	5 × 3 = 15	5 × 4 = 20	5 × 5 = 25	5 × 6 = 30	5 × 7 = 35	5 × 8 = 40	5 × 9 = 45	5 × 10 = 50	5 × 11 = 55

So, t = 7 is the solution of the equation.

(c) Given that $\frac{z}{3} = 35$

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

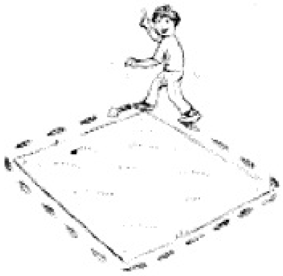
So, z = 12 is the solution of the equation.

(d) Given that m – 7 = 3

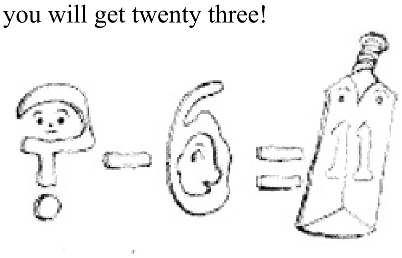
m	5	6	7	8	9	10	11	12	13
$m - 7$	$5 - 7 = -2$	$6 - 7 = -1$	$7 - 7 = 0$	$8 - 7 = 1$	$9 - 7 = 2$	$10 - 7 = 3$	$11 - 7 = 4$	$12 - 7 = 5$	$13 - 7 = 6$

So, m = 10 is the solution of the equation.

Ex 11.5 Class 6 Maths Question 5.
Solve the following riddles, you may yourself construct such 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 upcount 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 you a pretty clue!
you will get me back
If you take me out of twenty two!
Solution:
(i) According to the condition,
I + 12 = 34 or x + 12 = 34
∴ By inspection, we have
22 + 12 = 34
So, I am 22.

(ii) Let I am ‘x’.
We know that there are 7 days in a week.
∴ upcounting from x for 7, the sum = 23
By inspections, we have
16 + 7 = 23
∴ x = 16
Thus I am 16.

(iii) Let the special number be x and there are 11 players in cricket team.
∴ Special Number -6 = 11
∴ x – 6 = 11
By inspection, we get
17 – 6 = 11
∴ x = 17
Thus I am 17.

(iv) Suppose I am 'x'.
∴ 22 – I = I
or 22 – x = x
By inspection, we have
22 – 11 = 11
∴ x = 11
Thus I am 11.

Exercise 11.5

Question 1:

State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from 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) $7 - x = 5$

Answer:

(a) An equation with variable x
(b) An inequality
(c) No, it is a numerical equation.
(d) No, it is a numerical equation.
(e) An equation with variable x
(f) An equation with variable x
(g) An inequality
(h) An equation with variable n
(i) No, it is a numerical equation.
(j) An equation with variable p

(k) An equation with variable y
(l) An inequality
(m) An inequality
(n) No, it is a numerical equation.
(o) An equation with variable x

Question 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)	$p + 3 = 1$	$P = -2$	-

Answer:

(a) $10y = 80$

$y = 10$ is not a solution to the given equation because for $y = 10$,

$10y = 10 \times 10 = 100$, and not 80

(b) $10y = 80$

$y = 8$ is a solution to the given equation because for $y = 8$,

$10y = 10 \times 8 = 80$ and hence, the equation is satisfied.

(c) $10y = 80$

$y = 5$ is not a solution to the given equation because for $y = 5$,

$10y = 10 \times 5 = 50$, and not 80

(d) $4l = 20$

$l = 20$ is not a solution to the given equation because for $l = 20$,

$4l = 4 \times 20 = 80$, and not 20

(e) $4l = 20$

$l = 80$ is not a solution to the given equation because for $l = 80$,

$4l = 4 \times 80 = 320$, and not 20

(f) $4l = 20$

$l = 5$ is a solution to the given equation because for $l = 5$,

$4l = 4 \times 5 = 20$ and hence, the equation is satisfied.

(g) $b + 5 = 9$

$b = 5$ is not a solution to the given equation because for $b = 5$,

$b + 5 = 5 + 5 = 10$, and not 9

(h) $b + 5 = 9$

$b = 9$ is not a solution to the given equation because for $b = 9$,

$b + 5 = 9 + 5 = 14$, and not 9

(i) $b + 5 = 9$

$b = 4$ is a solution to the given equation because for $b = 4$,

$b + 5 = 4 + 5 = 9$ and hence, the equation is satisfied.

(j) $h - 8 = 5$

$h = 13$ is a solution to the given equation because for $h = 13$,

$h - 8 = 13 - 8 = 5$ and hence, the equation is satisfied.

(k) $h - 8 = 5$

$h = 8$ is not a solution to the given equation because for $h = 8$,

$h - 8 = 8 - 8 = 0$, and not 5

(l) $h - 8 = 5$

$h = 0$ is not a solution to the given equation because for $h = 0$,

$h - 8 = 0 - 8 = -8$, and not 5

(m) $p + 3 = 1$

$p = 3$ is not a solution to the given equation because for $p = 3$,

$p + 3 = 3 + 3 = 6$, and not 1

(n) $p + 3 = 1$

$p = 1$ is not a solution to the given equation because for $p = 1$,

$p + 3 = 1 + 3 = 4$, and not 1

(o) $p + 3 = 1$

$p = 0$ is not a solution to the given equation because for $p = 0$,

$p + 3 = 0 + 3 = 3$, and not 1

(p) $p + 3 = 1$

$p = -1$ is not a solution to the given equation because for $p = -1$,

$p + 3 = -1 + 3 = 2$, and not 1

(q) $p + 3 = 1$

$p = -2$ is a solution to the given equation because for $p = -2$,

$p + 3 = -2 + 3 = 1$ and hence, the equation is satisfied.

Question 3:

Pick out the solution from the values given in the bracket next to each equation. Show that the other values do not 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)

Answer:

(a) $5m = 60$

$m = 12$ is a solution to the given equation because for $m = 12$,

$5m = 5 \times 12 = 60$ and hence, the equation is satisfied.

$m = 10$ is not a solution to the given equation because for $m = 10$,

$5m = 5 \times 10 = 50$, and not 60

$m = 5$ is not a solution to the given equation because for $m = 5$,

$5m = 5 \times 5 = 25$, and not 60

$m = 15$ is not a solution to the given equation because for $m = 15$,

$5m = 5 \times 15 = 75$, and not 60

(b) $n + 12 = 20$

$n = 8$ is a solution to the given equation because for $n = 8$,

$n + 12 = 8 + 12 = 20$ and hence, the equation is satisfied.

$n = 12$ is not a solution to the given equation because for $n = 12$,

$n + 12 = 12 + 12 = 24$, and not 20

$n = 20$ is not a solution to the given equation because for $n = 20$,

$n + 12 = 20 + 12 = 32$, and not 20

$n = 0$ is not a solution to the given equation because for $n = 0$,

$n + 12 = 0 + 12 = 12$, and not 20

(c) $p - 5 = 5$

$p = 10$ is a solution to the given equation because for $p = 10$,

$p - 5 = 10 - 5 = 5$ and hence, the equation is satisfied.

$p = 0$ is not a solution to the given equation because for $p = 0$,

$p - 5 = 0 - 5 = -5$, and not 5

$p = 5$ is not a solution to the given equation because for $p = 5$,

$p - 5 = 5 - 5 = 0$, and not 5

$p = -5$ is not a solution to the given equation because for $p = -5$,

$p - 5 = -5 - 5 = -10$, and not 5

(d) $\frac{q}{2} = 7$

$q = 14$ is a solution to the given equation because for $q = 14$,

$\frac{q}{2} = \frac{14}{2} = 7$ and hence, the equation is satisfied.

$q = 7$ is not a solution to the given equation because for $q = 7$,

$\frac{q}{2} = \frac{7}{2}$, and not 7

$q = 2$ is not a solution to the given equation because for $q = 2$,

$\frac{q}{2} = \frac{2}{2} = 1$, and not 7

$q = 10$ is not a solution to the given equation because for $q = 10$,

$\frac{q}{2} = \frac{10}{2} = 5$, and not 7

(e) $r - 4 = 0$

$r = 4$ is a solution to the given equation because for $r = 4$,

$r - 4 = 4 - 4 = 0$ and hence, the equation is satisfied.

$r = -4$ is not a solution to the given equation because for $r = -4$,

$r - 4 = -4 - 4 = -8$, and not 0

$r = 8$ is not a solution to the given equation because for $r = 8$,

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$r = 8$ is not a solution to the given equation because for $r = 8$,

$r - 4 = 8 - 4 = 4$, and not 0

$r = 0$ is not a solution to the given equation because for $r = 0$,

$r - 4 = 0 - 4 = -4$, and not 0

(f) $x + 4 = 2$

$x = -2$ is a solution to the given equation because for $x = -2$,

$x + 4 = -2 + 4 = 2$ and hence, the equation is satisfied

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	...
$m - 7$	–	–	–	–	–	–	–	–	–	–

Answer:

Answer:

(a) For $m + 10$, the table can be constructed as follows.

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	$9 + 10 = 19$

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	...
$m - 7$	–	–	–	–	–	–	–	–	–	–

Answer:

(a) For $m + 10$, the table can be constructed as follows.

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	$10 + 10 = 20$

By inspection, we can find that $m = 6$ is the solution of the above equation as for $m = 6$,

$m + 10 = 6 + 10 = 16$

(b) For $5t$, the table can be constructed as follows.

t	$5t$
3	$5 \times 3 = 15$
4	$5 \times 4 = 20$
5	$5 \times 5 = 25$
6	$5 \times 6 = 30$
7	$5 \times 7 = 35$
8	$5 \times 8 = 40$
9	$5 \times 9 = 45$
10	$5 \times 10 = 50$
11	$5 \times 11 = 55$

By inspection, we can find that $t = 7$ is the solution of the above equation as for $t = 7$, $5t = 5 \times 7 = 35$

(c) For $\frac{z}{3}$, the table can be constructed as follows.

(c) For $\frac{z}{3}$, the table can be constructed as follows.

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	$\frac{16}{3} = 5\frac{1}{3}$

By inspection, we can find that $z = 12$ is the solution of the above equation as for $z = 12$, $\frac{z}{3} = 4$

(d) For $m - 7$, the table can be constructed as follows.

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	$13 - 7 = 6$

By inspection, we can find that $m = 10$ is the solution of the above equation as for $m = 10$, $m - 7 = 10 - 7 = 3$

Question 5:

Solve the following riddles, you may yourself construct such 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 upcount 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!

Answer:

(i)There are 4corners in a square.

Thrice the number of corners in the square will be $3 \times 4 = 12$

When this result, i.e. 12, is added to the number, it comes to be 34. Therefore, the number will be the difference of 34 and 12 i.e., $34 - 12 = 22$

(ii) 23 was the result when the old number was up counted on Sunday.

22 was the result when the old number was up counted on Saturday.

21 was the result when the old number was up counted on Friday.

20 was the result when the old number was up counted on Thursday.

19 was the result when the old number was up counted on Wednesday.

18 was the result when the old number was up counted on Tuesday.

17 was the result when the old number was up counted on Monday.

Therefore, number taken at the start $= 17 - 1 = 16$

(iii) In a cricket team, there are 11 players. Hence, the number is such that when 6 is subtracted from it, the result is 11. Therefore, the number is $11 + 6 = 17$

(iv) The number is such that when it is subtracted from 22, the result is again the number itself. The number is 11, which again gives 11, when it is subtracted from 22.