MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

ALGEBRA

Exercise 11 1

1. 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.

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2. 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?

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3. Find the rule which gives the number of matchsticks required to make thefollowing matchstick patterns. Use a variable to write the rule.(a) A pattern of letter T as(b) A pattern of letter Z as(c) A pattern of letter U as(d) A pattern of letter V as(e) A pattern of letter E as(f) A pattern of letter S as(g) A pattern of letter A as

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

5. 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.)

6. 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.)

7. 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.

8. 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.

9. 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?

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10. (a)   Look at the following matchstick pattern of squares (Fig 11.6). 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) Fig 11.7 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.

11. 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?

1. Which out of the following are expressions with numbers only? (a) $y + 3$ (b) $(7 \times 20) - 8z$ (c) $5(21 - 7) + \times 2$ (d) 5 (e) $3x$ (f) $5 - 5n$ (g) $(7 \times 20) - (5 \times 10) - 45 + p$

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2. 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) $17y, \dfrac{y}{17}, 5z$ (c) $7m, \; -7m + 3, \; -7m - 3$

3. 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.

4. (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.

5. 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

6. Give expressions in the following cases. (a) 11 added to 2 m (b) 11 subtracted from 2 m (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.

Exercise 11 2

1. 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 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 variables a, b and c.

2. 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 (Fig 11.12) AB is a diameter of the circle; C is its centre.) Express the diameter of the circle (d) in terms of its radius (r).

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

4. A cube is a three-dimensional figure as shown in Fig 11.11. 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.

5. The side of a regular hexagon (Fig 11.10) is denoted by l. Express the perimeter of the hexagon using l. A regular hexagon has all its six sides equal in length.)

Exercise 11 5

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

2. Solve the following riddles, you may yourself construct such riddles.(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 backIf you take me out of twenty two!

3. 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) $\dfrac{4}{2} = 2$ (d) $(7 \times 3) - 19 = 8$ (e) $5 \times 4 - 8 = 2x$ (f) $x - = 0$ (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) $\dfrac{3q}{2} < 5$ (m) $z + 12 > 24$ (n) $20 = (10 - 5) = 3 \times 5$ (o) $7 - x = 5$

4. Complete the entries in the third column of the table.

5. 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) $5 = 60(10, 5, 12, 15)$ (b) $n + 12 = 20(12, 8, 20, 0)$ (c)

$p - 5 = 5(0, 10, 5 - 5)$ (d)

$\dfrac{q}{2} = 7(7, 2, 10, 14)$ (e) $r - 4 = 0(4, -4.8.0)$

(f) $x + 4 = 2(-2, 0, 2, 4)$

Exercise 11 4

1. (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 of her age in the future or in the past. What will the following expression indicate?

$y + 7, y - 3, y + (4)\dfrac{1}{2}, (2)\dfrac{1}{2}$. (c) Given n students in the class like football, what may $2n$ show ? What may $\dfrac{n}{2}$ show ? (Hint : Think of games others than football)Type here in ASCII with maths in back tick :

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 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

3. 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 isher father's age?

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