



## MATHS

### BOOKS - SUBHASH PUBLICATION

## ALGEBRA

### Exercise

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 Z as



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2. 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 U as

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3. 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 V as

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4. 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 E as



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5. Find the rule which gives the number of matchsticks required to make the following matchstick patterns. Use a variable to write the rule. A pattern of letter S as



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6. 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



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7. 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

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8. 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.)

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**9.** 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.)

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**10.** 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.)

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**11.** A bird flies 1 kilometer in one minute. Can you express the distance covered by the bird in terms of its flying time

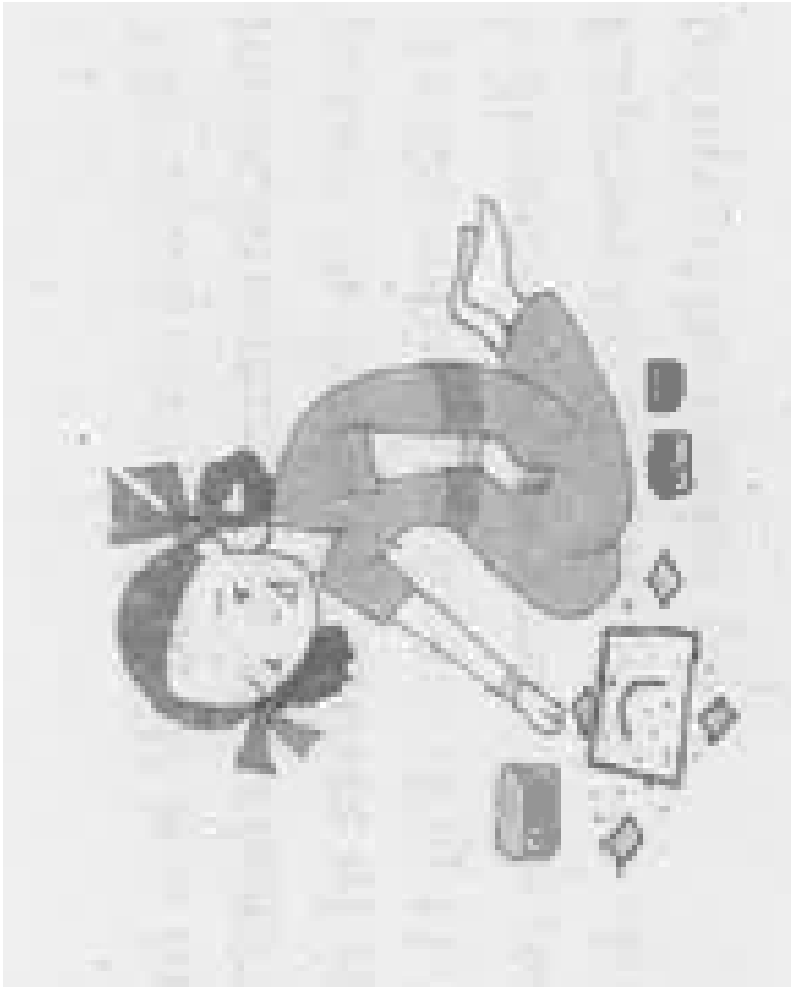
in minutes?(Use  $t$  for flying time in minutes.)



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**12.** 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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**13.** 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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**14.** 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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**15.** 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?



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**16. (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.)



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17. (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.) (c)



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**18. (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.) (d)



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A. q11-a-look-at-the-following-ma | LIDO

B.

C.

D.

**Answer:**





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19. (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. (a)



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A. q11-a-look-at-the-following-ma | LIDO

B.

C.

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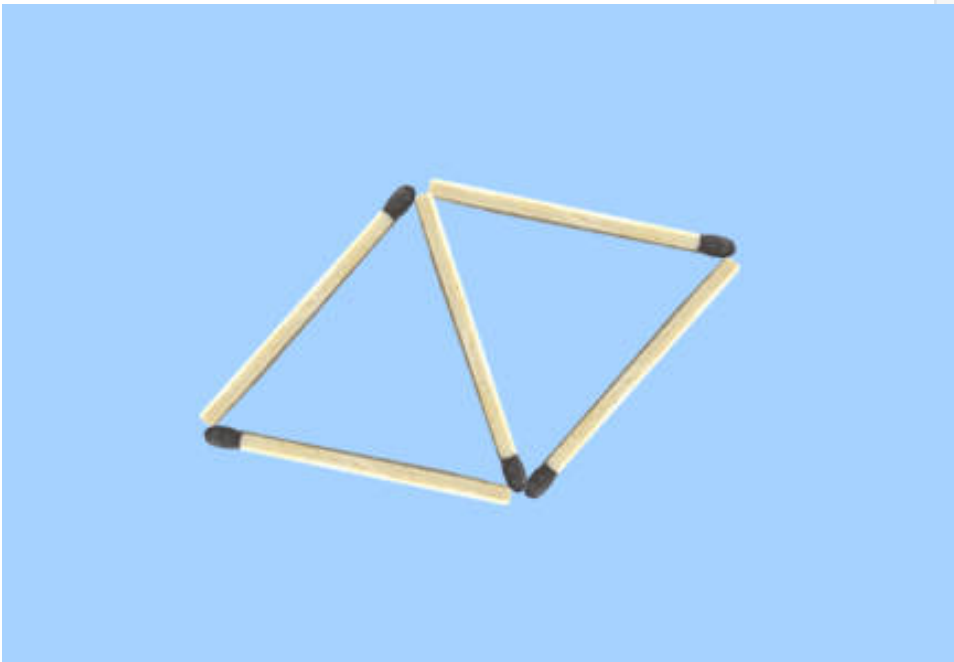
**Answer:**



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20. (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.(b)

A.



B.

C.

D.

**Answer:**



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**21.** (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.(c)



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B.

C.

D.

**Answer:**

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22. (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.(c)

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

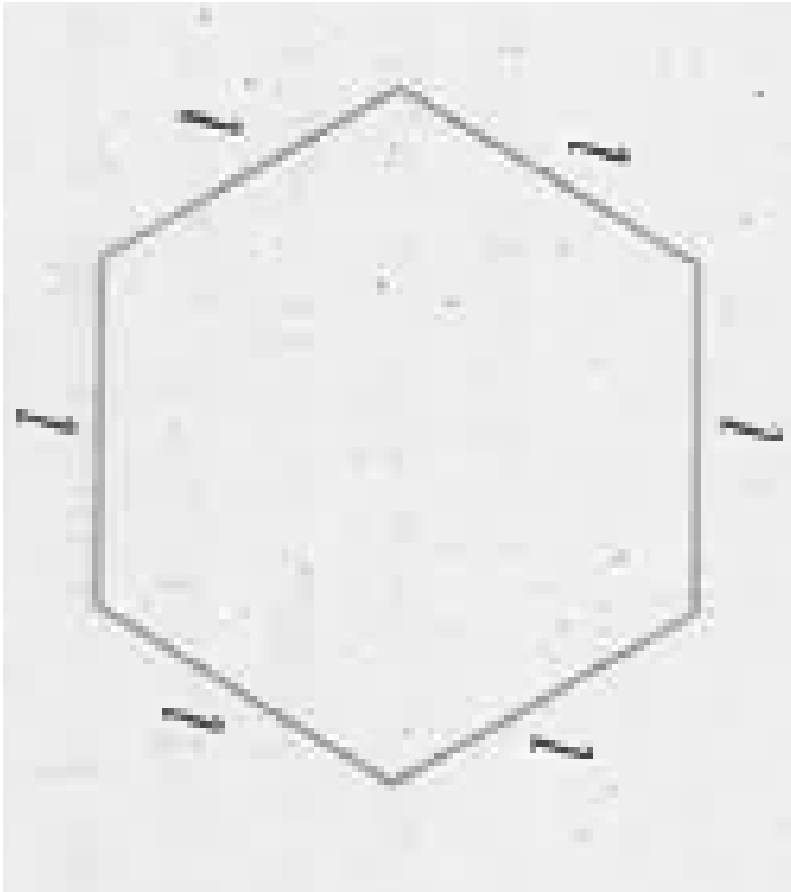


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**24.** The side of a regular hexagon (Fig.) is denoted by  $l$ .  
Express the perimeter of the hexagon using  $l$ . (Hint : A



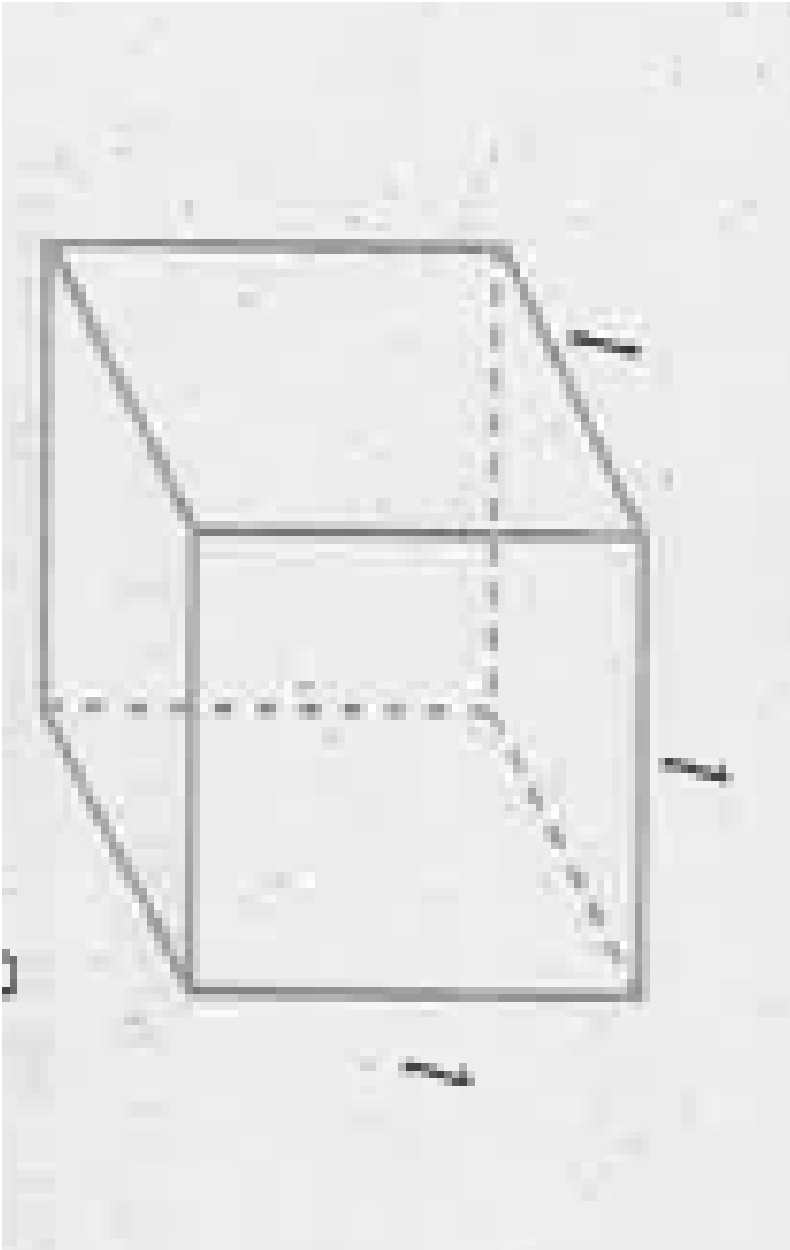
regular hexagon has all its six sides equal in length.)



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**25.** A cube is a three-dimensional figure as shown in Fig. 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.

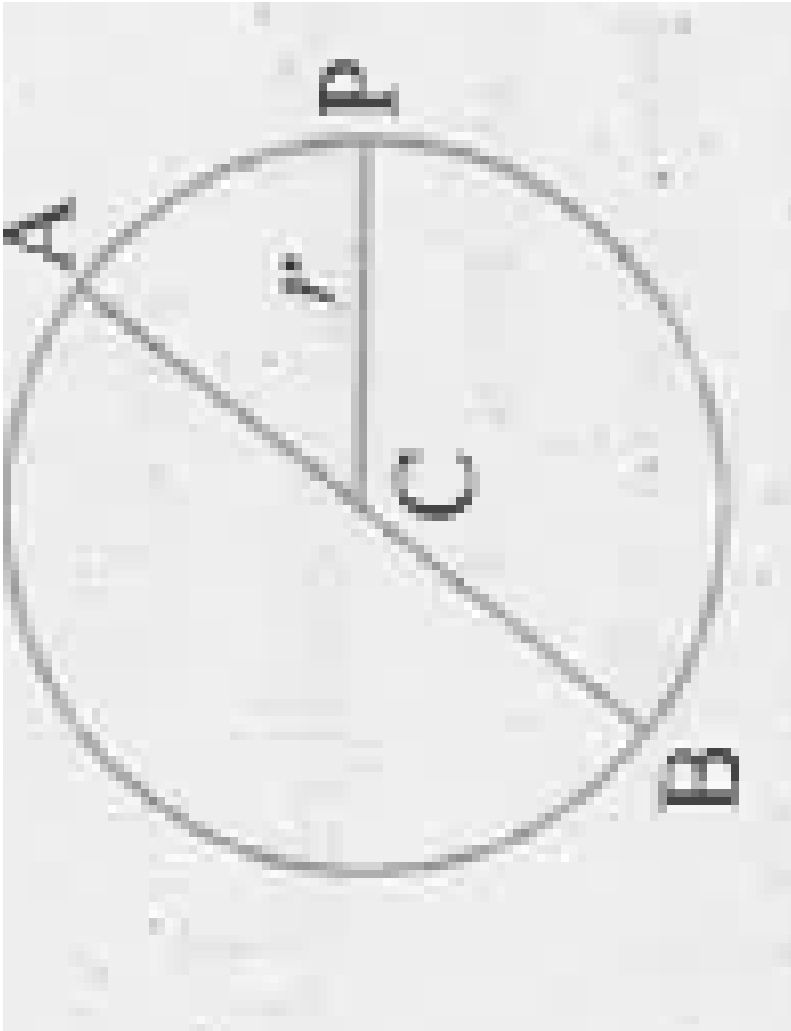




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**26.** The diameter of a circle is a line which joins two points on the circle and also passes through the centre of the circle. (In the adjoining figure (Fig 11.12) AB is a diameter of the circle, C is its centre.) Express the

diameter of the circle ( $d$ ) in terms of its radius ( $r$ ).



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**27.** 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 (b) or we may add 27 and 13 to get 40 and then add 14 to get the sum 54

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**28.** To find sum of three numbers 14,27 and 13, we can have two ways : we may first add 14 and 27 to get 41 and then add 13 to it to get the total sum 54 (b) or We may add 27 and 13 to get 40 and then add 14 to get the sum 54. Thus,  $(14+27)+13 = 14+(27+13)$

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**29.** Make up as many expressions with numbers (on variables) as you can from three 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.)



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**30.** Which out of the following are expressions with numbers only? (a)  $y+3$



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31. Which out of the following are expressions with numbers only? (b)  $(7 \times 20) - 8z$

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32. Which out of the following are expressions with numbers only? (c)  $5(21-7)+7 \times 2$

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33. Which out of the following are expressions with numbers only? (d) 5

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34. Which out of the following are expressions with numbers only? (e)  $3x$



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35. Which out of the following are expressions with numbers only? (f)  $5-5n$



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36. Which out of the following are expressions with numbers only? (g)  $(7 \times 20) - (5 \times 10) - 45 + p$



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**37.** Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how the expressions have been formed. (a)  $z+1, z-1, y+17, y-17$



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**38.** Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how the expressions have been formed. (b)  $17y, y/17, 5z$



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**39.** Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how the expressions have been formed. (c)  $2y+17, 2y-17$

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**40.** Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how the expressions have been formed. (d)  $7m, -7m+3, -7m-3$

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**41.** Give expressions for the following cases.(a) 7 added to  
p

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**42.** Give expressions for the following cases.(b) 7  
subtracted from p

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**43.** Give expressions for the following cases.(c) p  
multiplied by 7

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**44.** Give expressions for the following cases.(d)  $p$  divided by 7



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**45.** Give expressions for the following cases.(e) 7 subtracted from  $-m$



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**46.** Give expressions for the following cases.(f)  $-p$  multiplied by 5



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47. Give expressions for the following cases.(g)  $-p$  divided by 5

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48. Give expressions for the following cases.(h)  $p$  multiplied by  $-5$

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49. Give expressions in the following cases. (a) 11 added to  $2m$

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50. Give expressions in the following cases. (b) 11 subtracted from  $2m$

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51. Give expressions in the following cases. (c) 5 times  $y$  to which 3 is added

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52. Give expressions in the following cases. (d) 5 times  $y$  from which 3 is subtracted

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53. Give expressions in the following cases. (e)  $y$  is multiplied by  $-8$

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54. Give expressions in the following cases. (f)  $y$  is multiplied by  $-8$  and then  $5$  is added to the result

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55. Give expressions in the following cases. (g)  $y$  is multiplied by  $5$  and the result is subtracted from  $16$

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56. Give expressions in the following cases.(h)  $y$  is multiplied by  $-5$  and the result is added to  $16$ .



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57. From expressions using  $t$  and  $4$ . Use not more than one number operation. Every expression must have  $t$  in it.



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58. From expressions using  $y$ ,  $2$  and  $7$ . Every expression must have  $y$  in it. Use only two number operations. These should be different.



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**59.** Answer the following: (a) Take Sarita's present age to be  $y$  years (i) What will be her age 5 years from now?

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**60.** Answer the following: (a) Take Sarita's present age to be  $y$  years (ii) What was her age 3 years back?

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**61.** Answer the following: (a) Take Sarita's present age to be  $y$  years (iii) Sarita's grandfather is 6 times her age.

What is the age of her grandfather?



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**62.** Answer the following: (a) Take Sarita's present age to be  $y$  years (iv) Grandmother is 2 years younger than grandfather. What is grandmother's age?



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**63.** Answer the following: (a) Take Sarita's present age to be  $y$  years (v) Sarita's father's age 5 years more than 3 times Sarita's age. What is her father's age?



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**64.** Answer the following: (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?

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**65.** Answer the following: (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.

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**66.** Answer the following: (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  $s$ .



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**67.** Answer the following: (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  $v$ .



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**68.** 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 ₹  $3p$ .



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**69.** 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.)(b) Tony puts  $q$  marbles on the table. He has  $8q$  marbles in his box.

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**70.** 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.)(c ) Our class has  $n$  students. The school has  $20n$  students.

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**71.** 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.)(d) Jaggu is  $z$  years old. His uncle is  $4z$  years old and his anut is  $(4z-3)$  years old.



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**72.** 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.)(e) In an arrangement of dots there are  $r$  rows.

Each row contains 5 dots.



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**73.** (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?



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**74.** (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?  $Y+7, y-3, y+4$   $1/2, y-2$   $1/2$ .





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75. (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).



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76. 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)  $17 = x + 7$



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**77.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (b)  $(t-7) > 5$

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**78.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (c)  $4/2 = 2$

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**79.** State which of the following are equations (with a variable). Give reason for your answer. Identify the

vaeiable from the equations with a variable. (d)  $(7 \times 3) - 19 = 8$



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**80.** State which of the following are equations (with a variable). Give reason for your answer. Identify the vaeiable from the equations with a variable. (e)  $5 \times 4 - 8 = 2x$



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**81.** State which of the following are equations (with a variable). Give reason for your answer. Identify the vaeiable from the equations with a variable. (f)  $x - 2 = 0$



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**82.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (g)  $2m < 30$

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**83.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (h)  $2n + 1 = 11$

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**84.** State which of the following are equations (with a variable). Give reason for your answer. Identify the

variable from the equations with a variable. (i)  $7=(11 \times 5) = (12 \times 4)$



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**85.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (j)  $7=(11 \times 2)+p$



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**86.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (k)  $20=5y(1)3q/2 < 5$



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**87.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (m)  $z+12>24$



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**88.** State which of the following are equations (with a variable). Give reason for your answer. Identify the variable from the equations with a variable. (n)  $20-(10-5)=3\times 5$



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



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90. 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)	$p + 3 = 1$	$p = -2$	



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**91.** 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)  $5m=60(10,5,12,15)$

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

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**93.** 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. (c)  $p-5=5(0,10,5-5)$



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**94.** 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. (d)  $q/2=7(7,2,10,14)$



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**95.** 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. (e)  $r-4=0(4,-4,8,0)$



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

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

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

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



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



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