RD SHARMA

Solutions

Class 6 Maths

Chapter 4

Ex 4.5

Q1. Without drawing a diagram, find:

Solution: (i) 10th square number:

A square number can easily be remembered by the following rule

N^{th} square number = n x n

10th square number = 10 x 10 = 100

(ii) 6th triangular number:

A triangular number can easily be remembered by the following rule

N^{th} triangular number = n x (n + 1)2

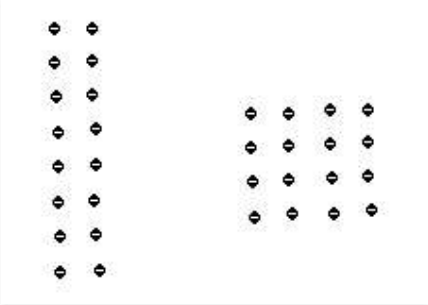
Therefore, 6^{th} triangular number = 6 x (6 + 1)2 = 21

Q2. (i) Can a rectangle number also be a square number ?

(ii) Can a triangular number also be a square number?

Solution:

(i) Yes, a rectangular number can also be a square number; for example, 16 is a square number also a rectangular number.



(ii) Yes, there exists only one triangular number that is both a triangular number and a square number, and that number is 1.

Q3. Write the first four products of two numbers with difference 4 starting from in the following order:

1 , 2 , 3 , 4 , 5 , 6 , ……..

Identify the pattern in the products and write the next three products.

Solution: 1 x 5 = 5 (5 – 1 = 4)

2 x 6 = 12 (6 – 2 =4)

3 x 7 = 21 (7 – 3 = 4)

4 x 8 = 32 (8 – 4 = 4)

Q4. Observe the pattern in the following and fill in the blanks:

Solution: 9 x 9 + 7 =88

98 x 9 + 6 = 888

987 x 9 + 5 = 8888

9876 x 9 + 4 = 88888

98765 x 9 + 3 = 888888

987654 x 9 + 2 = 8888888

9876543 x 9 + 1 = 88888888

Q5. Observe the following pattern and extend it to three more steps:

Solution: 6 x 2 – 5 = 7

7 x 3 – 12 = 9

8 x 4 – 21 = 11

9 x 5 – 32 = 13

10 x 6 – 45 = 15

11 x 7 – 60 = 17

12 x 8 – 77 = 19

Q6. Study the following pattern:

1 + 3 = 2 x 2

1 + 3 + 5 = 3 x 3

1 + 3 + 5 + 7 = 4 x 4

1 + 3 + 5 + 7 + 9 = 5 x 5

By observing the above pattern, find:

Solution: (i) 1 + 3 + 5 + 7 + 9 + 11

= 6 x 6

= 36

(ii) 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15

= 8 x 8

= 64

(iii) 21 + 23 + 25 + … + 51

= (21+23+25+…+51) can also be written as

(1+3+5+7+…+49+51) -(1+3+5+…+17+ 19)

(1+3 +5 +7+…+ 49 + 51)= 26 x 26 = 676

and, (1+3+5+…+17+ 19) = 10 x 10 = 100

Now,

(21 + 23 +25 +…+ 51)= 676 -100 = 576

Q7. Study the following pattern:

$$1\times1 + 2\times2 = \frac{2\times3\times5}{6}$$

$$1\times1 + 2\times2 + 3\times3 = \frac{3\times4\times7}{6}$$

$$1\times1 + 2 \times 2 + 3 \times 3 + 4 \times 4 = \frac{4\times5\times9}{6}$$

By observing the above pattern, write next two steps.

Solution: The next two steps are as follows:

1 x 1+2 x2+3 x 3+4 x4+5 x 5

=5x6x116

= 55

1 x 1+2 x2+3 x 3+4 x4+5 x 5+6 x6

=6x7x136

=91

Q8. Study the following pattern:

$$1 = \frac{1\times2}{2}$$

$$1 + 2 = \frac{2\times3}{2}$$

$$1 + 2 + 3 = \frac{3\times4}{2}$$

$$1 + 2 + 3 + 4 = \frac{4\times5}{2}$$

By observing the above pattern, find:

Solution: (i) 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10

= 10 x 112

= 55

(ii) 50 + 51 + 52 + … + 100

This can also be written as

(1 + 2 + 3 + … + 99 + 100) – (1 + 2 + 3 + 4 + … + 47 + 49)

Now,

(1+ 2 + 3 + … + 99 + 100) = 100 x 1012

and, (1 + 2 + 3 + 4 +… + 47 + 49) = 49 x 502

So, (50 + 51 + 52 + … + 100) = 100 x 1012 – 49 x 502

= 5050 – 1225

= 3825

(iii) 2 + 4 + 6 + 8 + 10 +… + 100

This can also be written as 2 x (1 + 2 + 3 + 4 + … + 49 + 50)

Now,

(1 + 2 + 3 + 4 + … + 49 + 50) = 50 x 512

= 1275

Therefore, (2 + 4 + 6 + 8 + 10 + … + 100) = 2 x 1275 = 2550