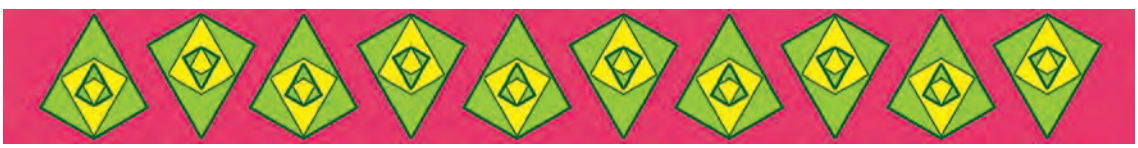
Can You See The Pattern?

Chapter 6



Now you use these two rules to make patterns with this  block, Also make your own rule.

Turns and Patterns

Look at this block  . We make three different rules to turn it clockwise and see the patterns.

Rule 1: Repeat it with a one- fourth turn.

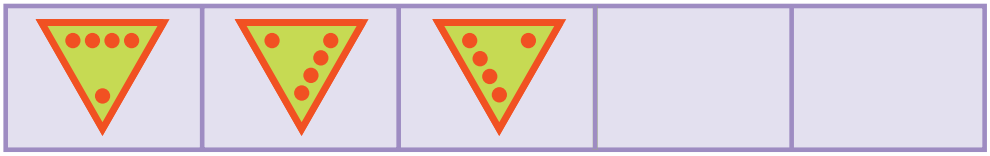
Rule 2: Repeat it with a half turn.

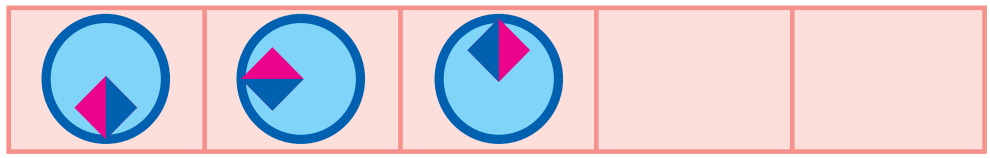
Rule 3: Repeat it with a three- fourth turn.

Practice Time

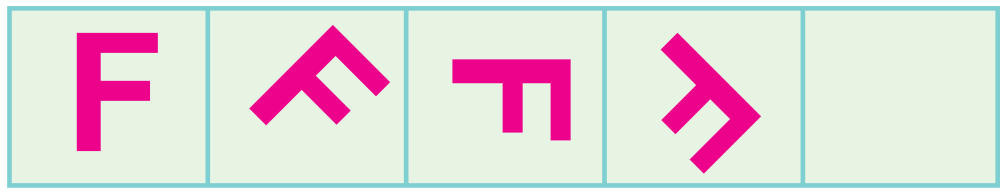
1. What should come next?

a) 

b) 

c) 

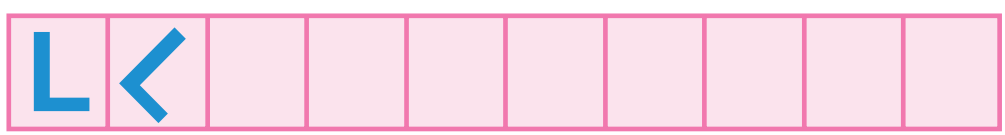
2. See this pattern

a) 

The **rule** of the pattern is – turning by 45° each time. Which will be the next?

Tick (✓) the right one.

Using the same rule take it forward till you get back to what you started with.

b) 

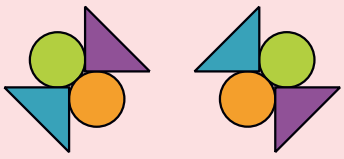
c) 

3. Some patterns are given below on the left side of the red line. For each pattern, write the rule. Then choose what comes next from the right side of the line and tick (✓) it.

a)

Rule: _____

_____

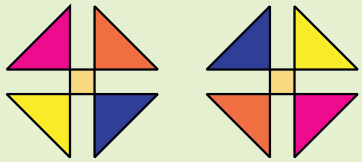


( ) ( )

b)

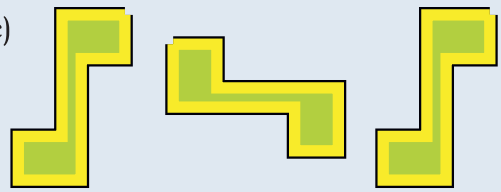
Rule: _____

_____



( ) ( )

c)



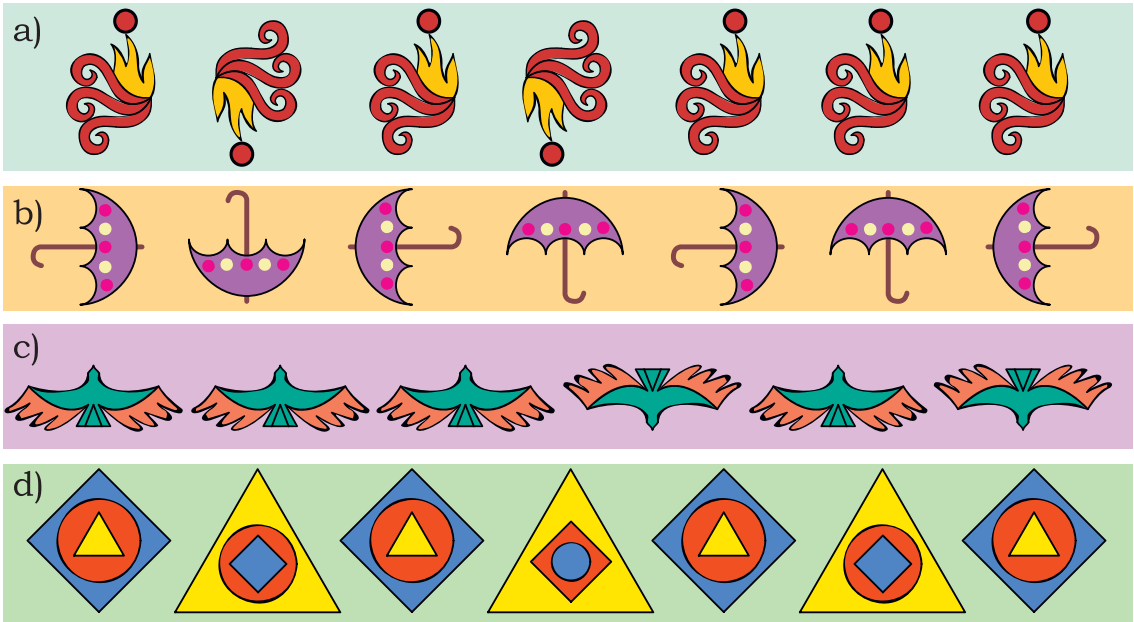
Rule: _____

_____

( ) ( )

Look For a Pattern

Mark that picture which is breaking the rule. Also correct it.



Magic Squares

Do you remember magic triangles? Come now, let's make some magic squares.

❖ Fill this square using all the numbers from 46 to 54.

Rule: The total of each line is 150

		49
46		
	52	47

	25	

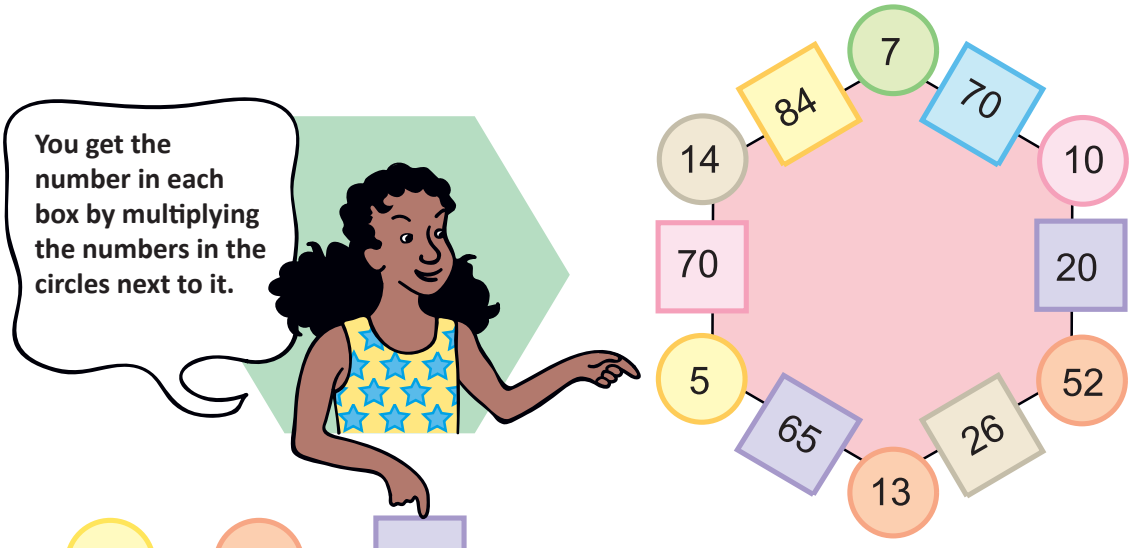
❖ Fill this square using all the numbers from 21 to 29.

Rule: The total of each side is 75.

Magic Hexagons

Look at the pattern of numbers in the Hexagons.

Each side has 2 circles and 1 box.



5 × 13 = 65

○ × ○ = 70

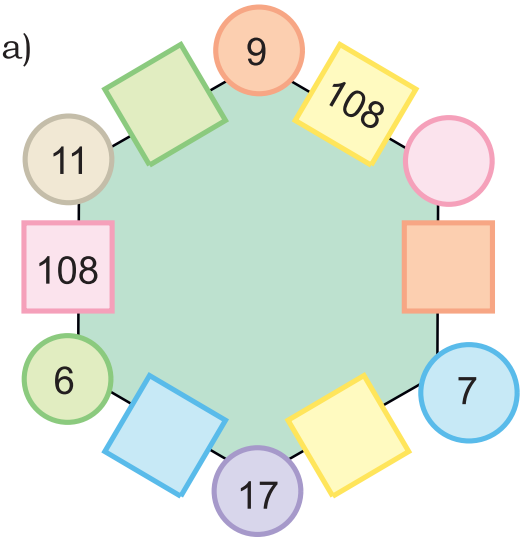
Look at the number 65 in the box.

Which are the circles next to it?

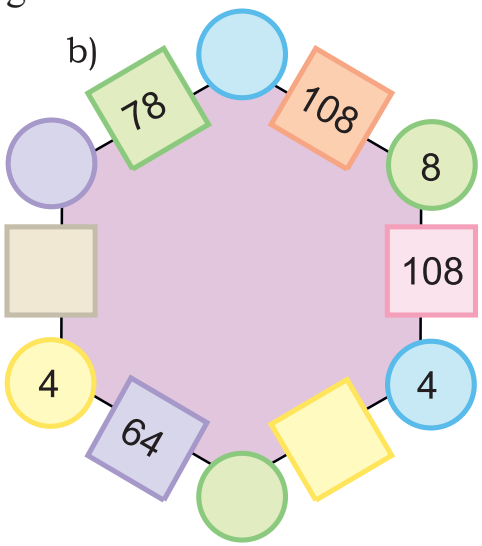
Can you see how the rule works?

❖ Use the same rule to fill the hexagons below.

a)

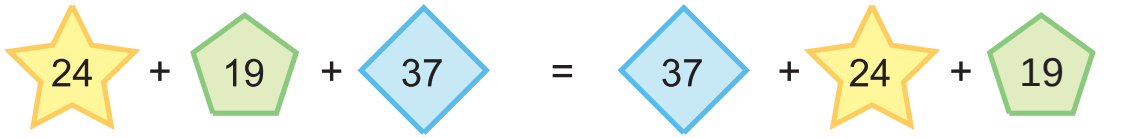


b)



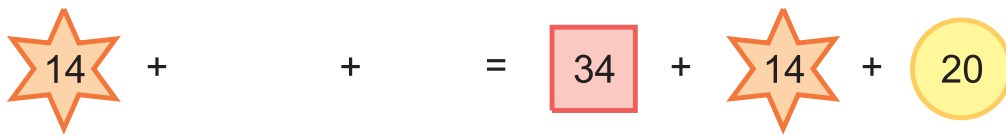
Now you also make your own hexagon.

Numbers and Numbers

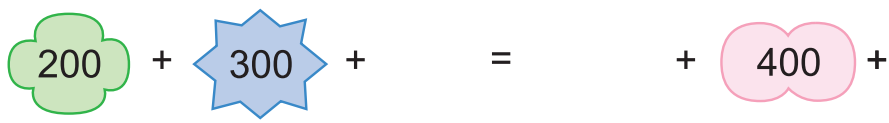


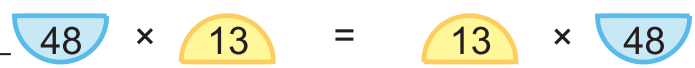
❖ Are they equal?

❖ Fill in the blank spaces in the same way.

a) 

b) 

c) 

❖ Now, look at this_____ 

Check if it is true or not.

Left Right – Same to Same

Take a number, say 43
Now turn it back to front 34
Then add them together 77
77 is one such special number.
There are many such numbers.

You have reversed the number by writing it back to front.

Take another number 48
Now turn it back to front 84
Then add them together 132
Is this a special number? No! Why not?
OK, carry on with the number 132
Again turn it front to back 231
Then add the two together 363
Ah! 363 is a special number.

So we see that to get a special numbers we sometimes need more steps.

❖ Now try and change these numbers into special numbers –

a) 28 b) 132 c) 273

Now let's use words in a special way,

NO LEMONS NO MELON

STEP NOT ON PETS

Did you notice that it reads the same from both sides – right to left and left to right?

Now try and use words in a special way.

Calendar Magic

Look at the calendar below.

Let us mark 3 × 3 [9 dates] on the calendar and see some magic.

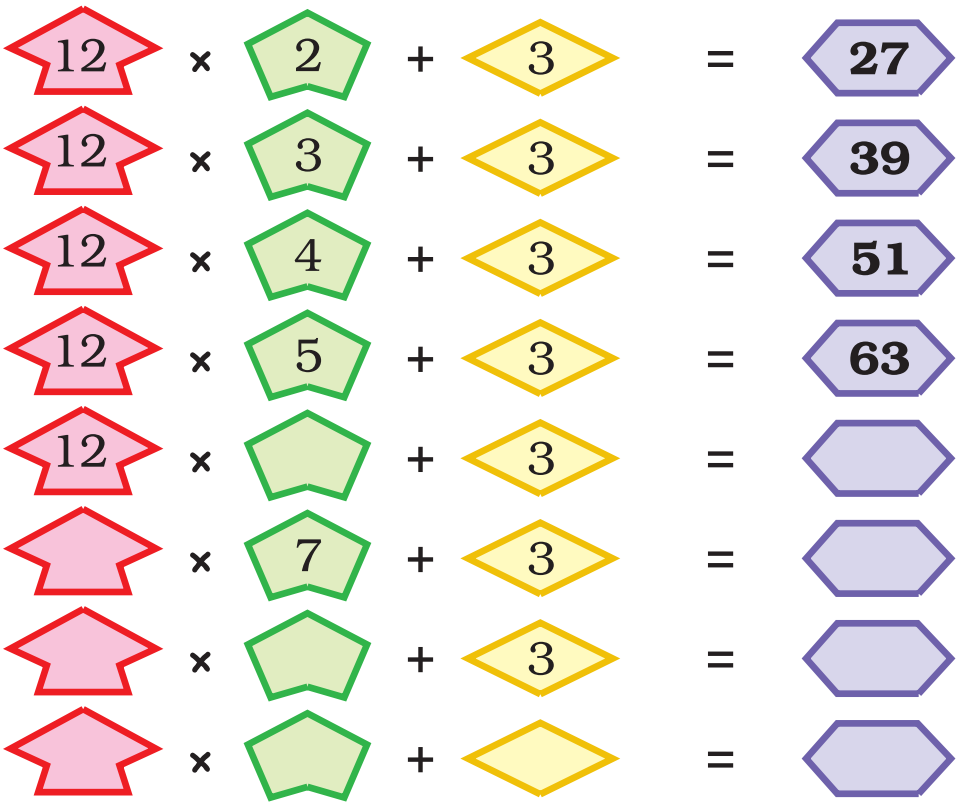
s	m	t	w	th	f	s
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	20
22	23	24	25	26	27	28
29	30	31				

Take the smallest number	3
Add 8 to it	+8
=	11
Multiply it by 9	×9
Total	99

Now you choose any 3×3 box from a calendar and find the total in the same way. Play this game with your family.

Some More Number Patterns

❖ Take any number. Now multiply it by 2, 3, 4…… at every step. Also add 3 to it at each step. Look at the difference in the answer. Is it the same at every step?



Now try doing it with some other number and also take a different number to add at each step.

❖ Look at the numbers below. Look for the pattern. Can you take it forward?

$(9 - 1) \div 8 = 1$

$(98 - 2) \div 8 = 12$

$(987 - 3) \div 8 = 123$

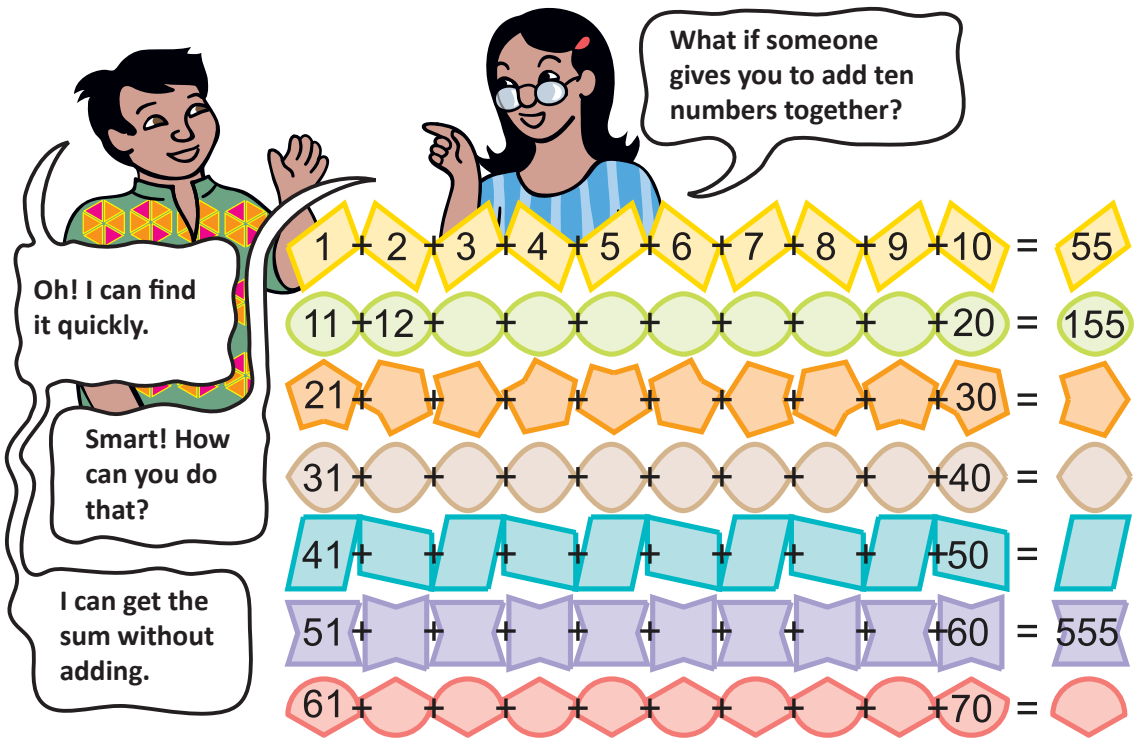
$(9876 - 4) \div 8 = \_\_\_\_$

$(98765 - 5) \div 8 = \_\_\_\_$

$(\_\_\_\_\_ - \_\_\_) \div 8 = \_\_\_\_$

$(\_\_\_\_\_ - \_\_\_) \div 8 = \_\_\_\_$

Smart Adding

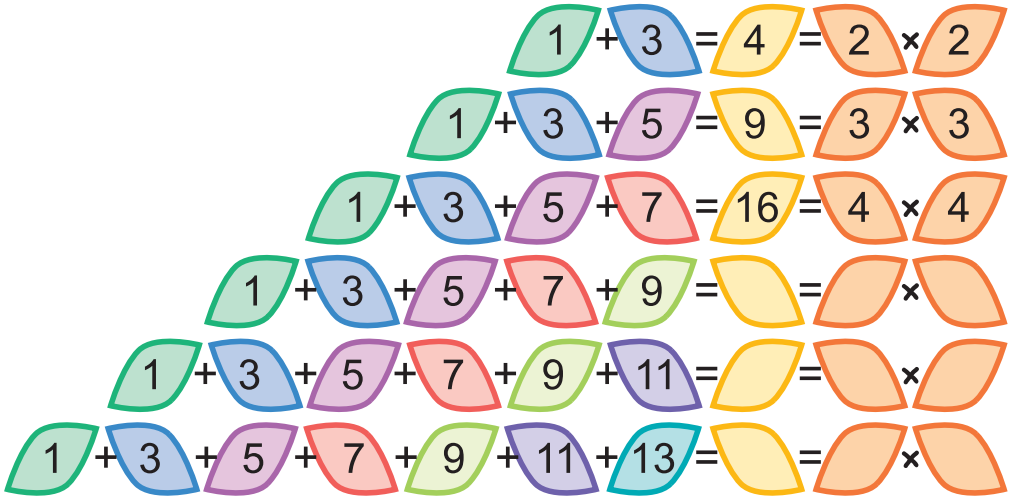


❖ Did you notice some patterns in the answers?

Fun with Odd Numbers

Take the first two numbers. Now add them, see what you get.

Now, at every step, add the next odd number.



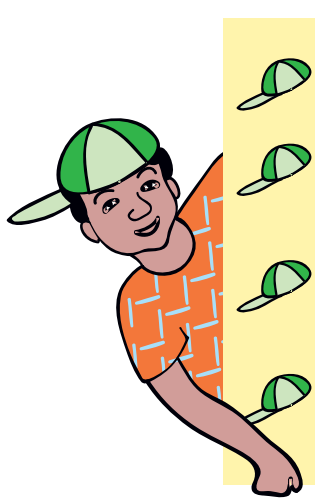
How far can you go on?

Secret Numbers

Jaffar and Asiya were playing a guessing game by writing clues about a secret number. Each tried to guess the other's secret number from the clues.

Can you guess their secret numbers?

- It is larger than half of 100
- It is more than 6 tens and less than 7 tens
- The tens digit is one more than the ones digit
- Together the digits have a sum of 11



- It is smaller than half of 100
- It is more than 4 tens and less than 5 tens
- The tens digit is two more than the ones digits.
- Together the digits have a sum of 6.

❖ Write a set of clues for a secret number of your own. Then give it to a friend to guess your secret number.

Number Surprises

a. Ask your friend - Write down your age. Add 5 to it. Multiply the sum by 2 . Subtract 10 from it. Next divide it by 2. What do you get?

Is your friend surprised?

b.

☆ Take a number ☐

☆ Double it ☐ × 2 = ☐

☆ Multiply by 5 ☐ × 5 = ☐

☆ Divide your answer by 10 ☐ ÷ 10 = ☐

c) Look at the pattern of numbers and take it forward.

$1 = 1 \times 1$

$121 = 11 \times 11$

$12321 = 111 \times 111$

$1234321 = ?$

d) ☆ Take a number ☐

☆ Double it ☐ × 2 = ☐

☆ Again double it ☐ × 2 = ☐

☆ Add the number you took first to the number. = ☐ × ☐ = ☐

☆ Now again double it. ☐ × 2 = ☐

☆ Divide by 10 ☐ × 10 = ☐

❖ Now make your own number surprises.

Now Let Us Do These

Q.NO. 1 Fill the 3 × 3 square using all the number from 1 to 9 so that total of each row, column and diagonal is 15.

	5	

Q.NO. 2 Write the next number in the pattern:

a. 1, 2, 4, 8, 16, _____

b. 1, 2, 3, 4, 9, 16, _____

c. ⌊, ⌋, ⌉, ⌈, _____

d. 1, 2, 2, 4, 8, 32, _____

Q.NO. 3 Complete the pattern:

$$1 = 1 = 1 \times 1$$

$$1 + 2 + 1 = 4 = 2 \times 2$$

$$1 + 2 + 3 + 2 + 1 = 9 = 3 \times 3$$

$$\_\_\_ + \_\_\_ + \_\_\_ + 4 + \_\_\_ + \_\_\_ + \_\_\_ = 16 = 4 \times 4$$

$$1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = \_\_\_ = \_\_\_ \times \_\_\_$$

$$\_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ + \_\_ = 36 = \_\_ \times \_\_$$

Q.NO. 4 Fill in the blanks:

a) 4 + 7 + 9 = 7 + ___ + 9

b) 17 + 24 + 36 = 36 + 24 + ___

c) 9 + 11 + 21 = ___ + ___ + 9

d) 45 × 35 = 35 × ___

e) 45 + 35 = ___ + 45

Q.NO. 5 Fill in the blanks:

0×1 ×2 +1 = 1 = 1 × 1 × 1

1 ×2 × 3 + 2 = 8 = 2 × 2 × 2

2 × 3 × 4 + 3 = 27 = 3 × 3 × 3

3 × 4 × 5 + 4 = 64 = 4 × 4 × 4

4 × 5 × 6 + 5 = 125 = __ × __ × __

__ × __ × __ + 6 = 216 = 6 × 6 × 6

__ × __ × __ + __ = 343 = __ × __ × __

Answers

Q.NO.1

6	7	2
1	5	9
8	3	4

Q.NO. 2 (a) 32 (b) 27 (c) ∟ (d) 256 (Product of previous 2 terms)

Q.NO.3 $1 + 2 + 3 + 4 + 3 + 2 + 1 = 16 = 4 \times 4$

$1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = 25 = 5 \times 5$

$1 + 2 + 3 + 4 + 5 + 6 + 5 + 4 + 3 + 2 + 1 = 36 = 6 \times 6$

Q.NO.4 (a) $4 + 7 + 9 = 7 + 4 + 9$

(b) $17 + 24 + 36 = 36 + 24 + 17$

(c) $9 + 11 + 21 = 21 + 11 + 9$

(d) $45 \times 35 = 35 \times 45$

(e) $45 + 35 = 35 + 45$

Q.NO.5 $4 \times 5 \times 6 + 5 = 125 = 5 \times 5 \times 5$

$5 \times 6 \times 7 + 6 = 216 = 6 \times 6 \times 6$

$6 \times 7 \times 8 + 7 = 343 = 7 \times 7 \times 7$