PAGE: 99

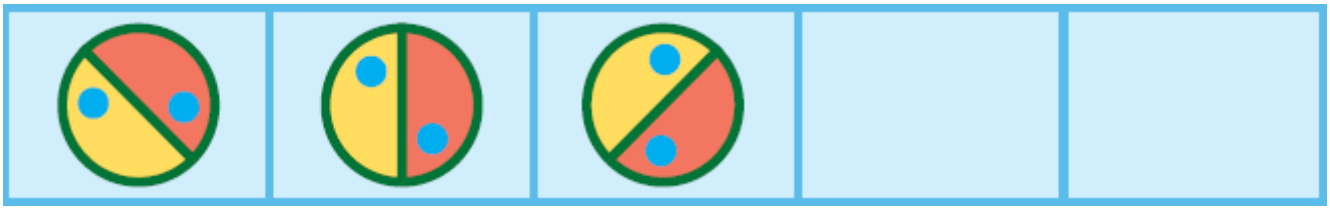
1.

Now you use these two rules to make patterns with this  block.

Solution:-

2. What should come next?

(a)

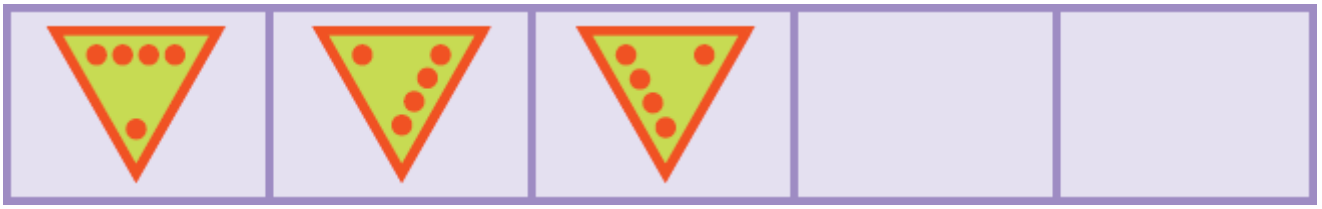


Solution:-

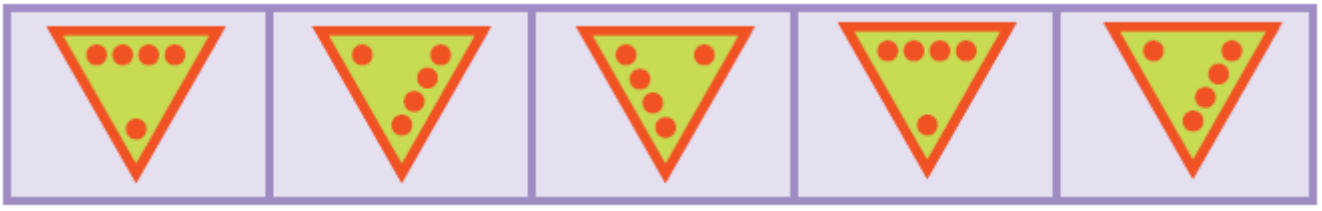
(b)

Solution:-

(c)



Solution:-



(d)

Solution:-

3. See this pattern

(a)

The rule of the pattern is turning by 45°each time. Which will be the next?
Tick (✓) the right one.

Solution:-

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

(a)

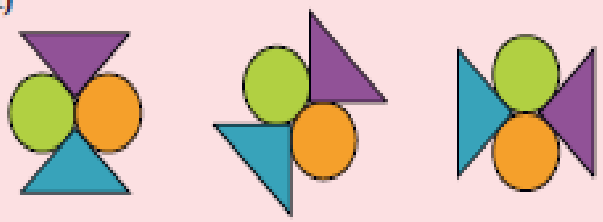
Solution:-

(b)

Solution:-

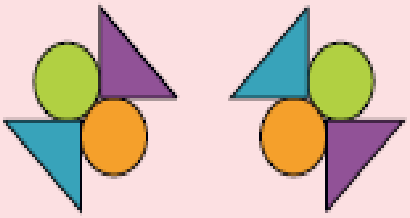
5. Some patterns are given below on the left side of the red line. For each pattern, write the rule. Then choose what comes next from the right side of the line and tick (✓) it.

a)



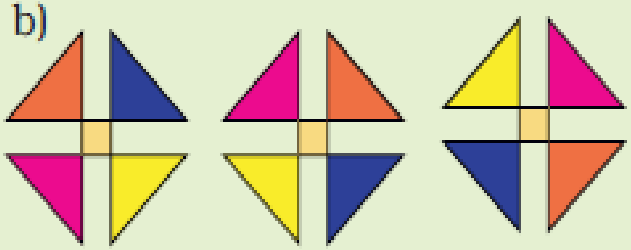
Rule: _____

_____



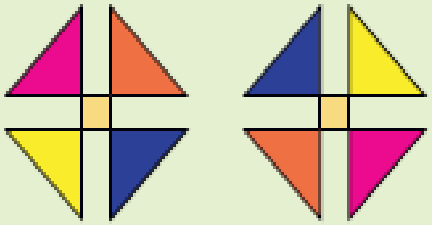
( ) ( )

b)



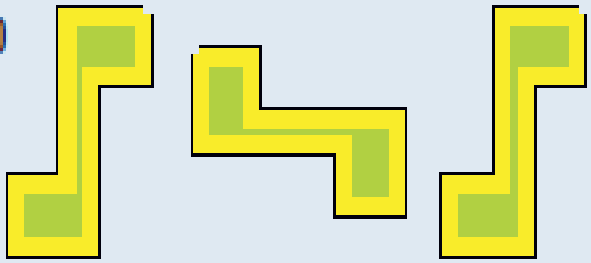
Rule: _____

_____



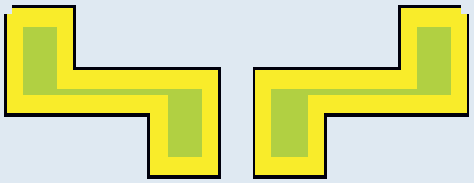
( ) ( )

c)



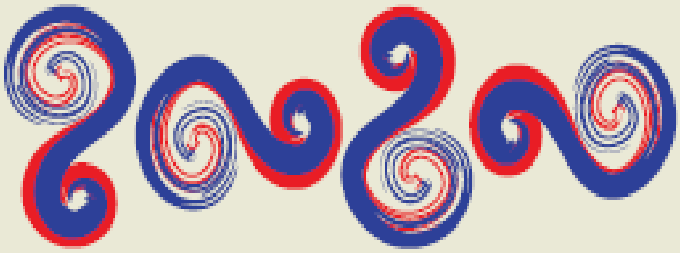
Rule: _____

_____



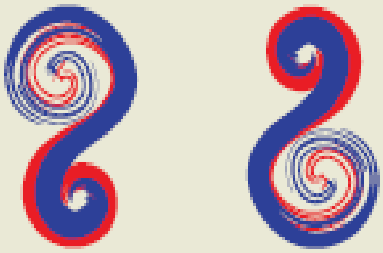
( ) ( )

d)



Rule: _____

_____



( ) ( )

Solution:-

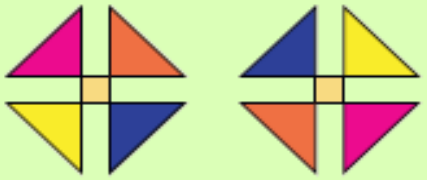
a)

Rule: Turn by 45° each time

( ) (✓)

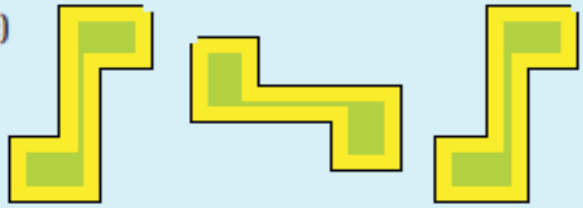
b)

Rule: Turn by 90° each time



( ) (✓)

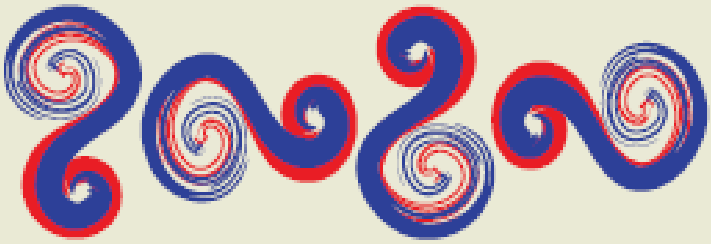
c)



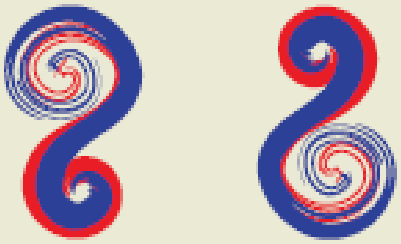
Rule: Turn by 90° each time

(✓) ( )

d)



Rule: Turn by 90° each time



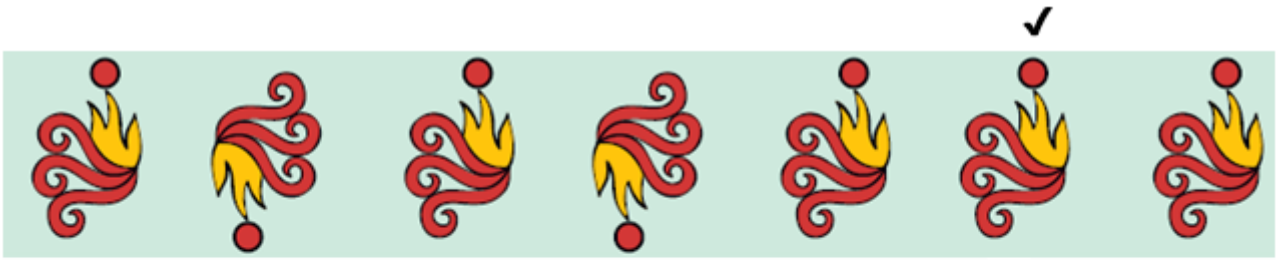
(✓) ( )

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

(a)

Solution:-

The below-marked picture breaks the rule.



The correct rule is as shown in the picture below.

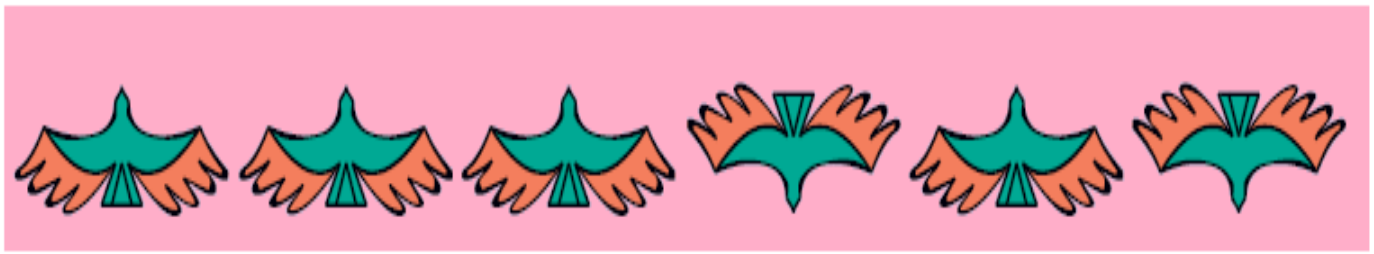
(b)

Solution:-

The below-marked picture breaks the rule.

The correct rule is as shown in the picture below.

(c)

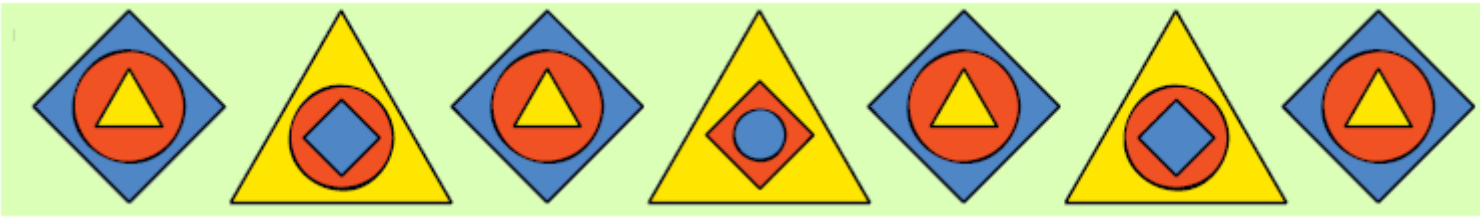


Solution:-

The below-marked picture breaks the rule.

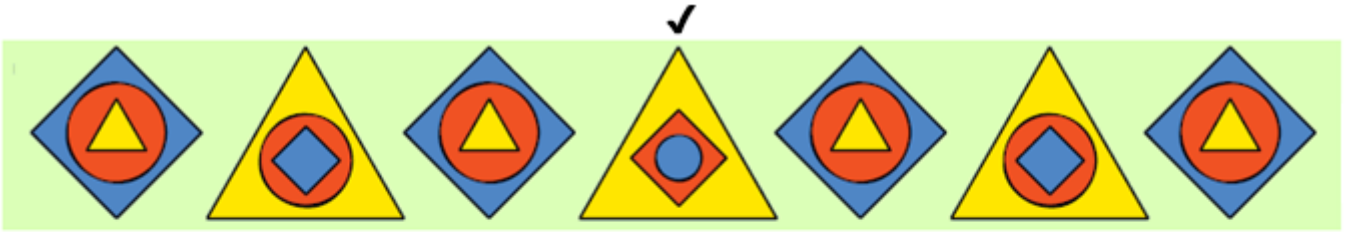
The correct rule is as shown in the picture below.

(d)

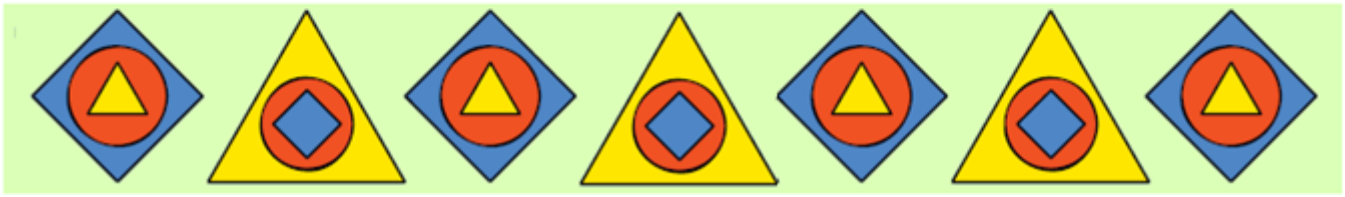


Solution:-

The below-marked picture breaks the rule.



The correct rule is as shown in the picture below.



7. Magic Squares

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

(i) Fill this square using all the numbers from 46 to 54.

Rule: The total of each line is 150.

		49
46		
	52	47

Solution:-

From the question, it is given that the total of each line is equal to 150.

So, let us take the third row.

From the rule, + 52 + 47 = 150

+ 99 = 150

= 150 – 99

Therefore, the number in the first box in the third row = 51

Now, let us take the first column.

From the rule, + 46 + 51 = 150

+ 97 = 150

= 150 – 97

Therefore, the number in the first box in the first column = 53

Let us take the first row.

From the rule, 53 + + 49 = 150

+ 102 = 150

= 150 – 102

Therefore, the number in the second box in the first row = 48

Let us take the second column.

From the rule, 48 + + 52 = 150

+ 100 = 150

= 150 – 100

Therefore, the number in the second box in the second column = 50

Let us take the third column,

From the rule, 49 + + 47 = 15

+ 96 = 150

= 150 – 96

Therefore, the number in the second box in the third column = 54

53	48	49
46	50	54
51	52	47

(ii) Fill this square using all the numbers from 21 to 29.

Rule: The total of each side is 75.

	25	

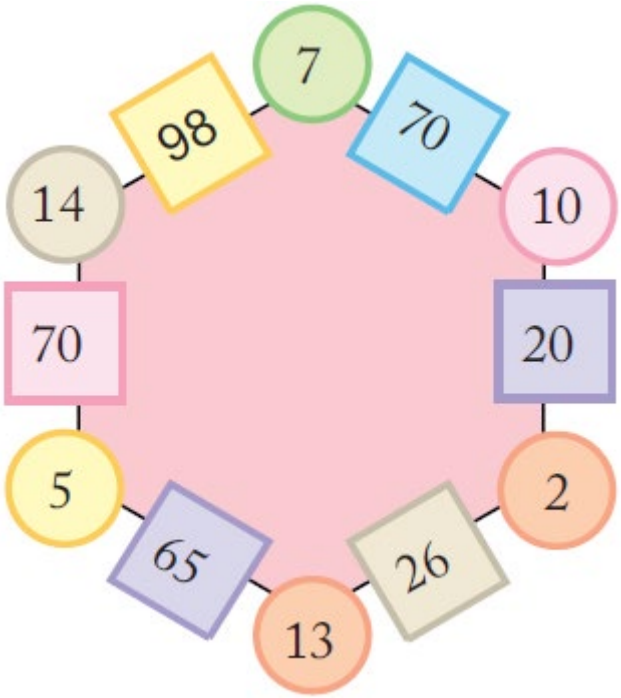
Solution:-

From the question, it is given that the total of each line is equal to 75.

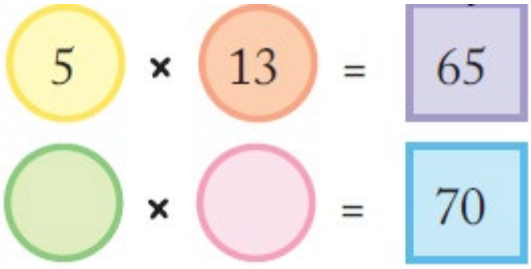
24	23	28
29	25	21
22	27	26

8. Magic Hexagons

Look at the patterns of numbers in hexagons. Each side has 2 circles and 1 box.

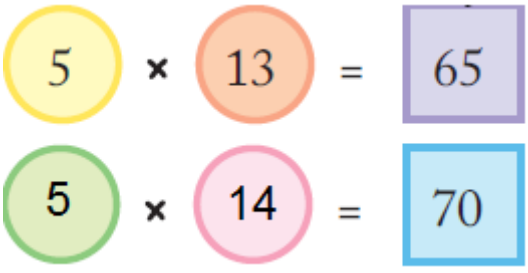


Look at the number 65 in the box. Which are the circles next to it? Can you see how the rule works?



Solution:-

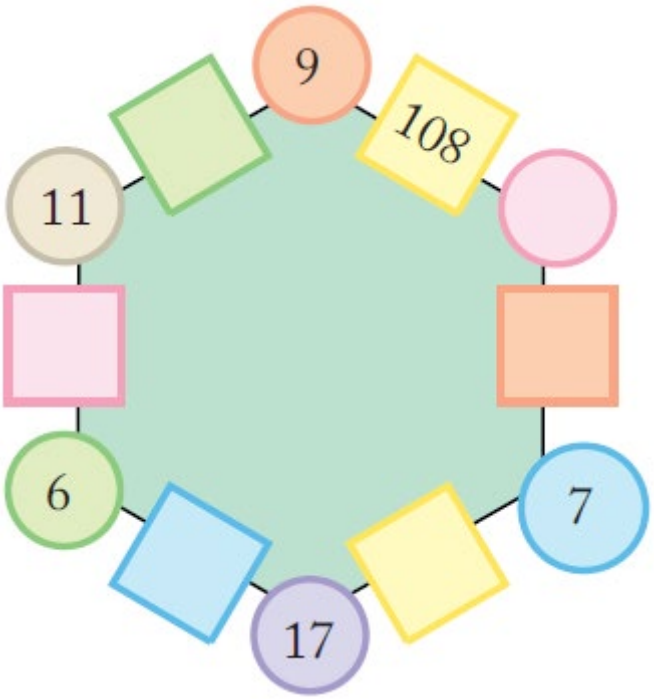
The circles next to 65 are 5 and 13.

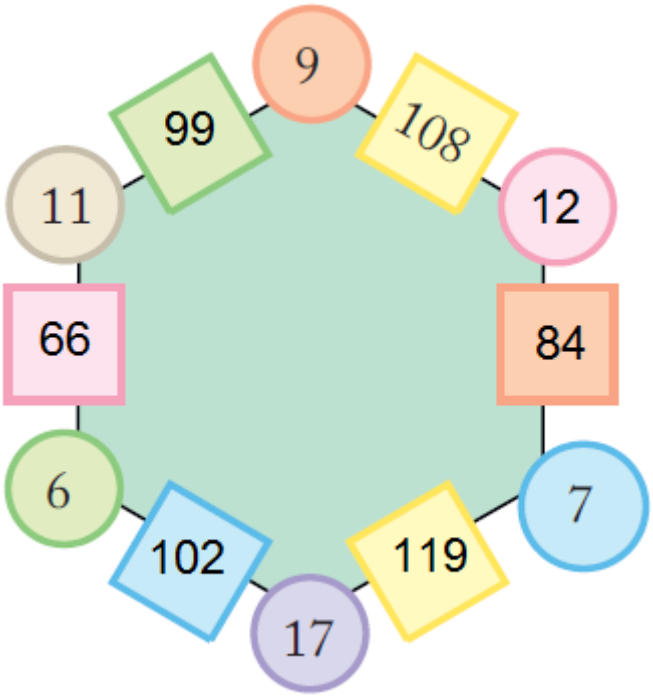


The rule of this method is we get the number in each box by multiplying the numbers in the circles next to it.

(i) Use the same rule to fill the hexagons below.

(a)





Solution:-

11 × 9 = 99

11 × 6 = 66

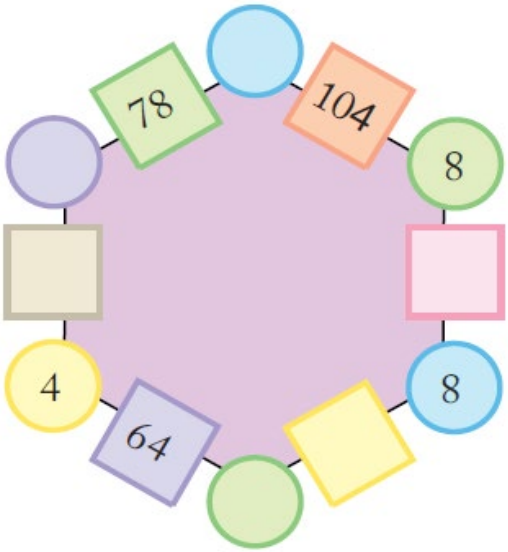
6 × 17 = 102

17 × 7 = 119

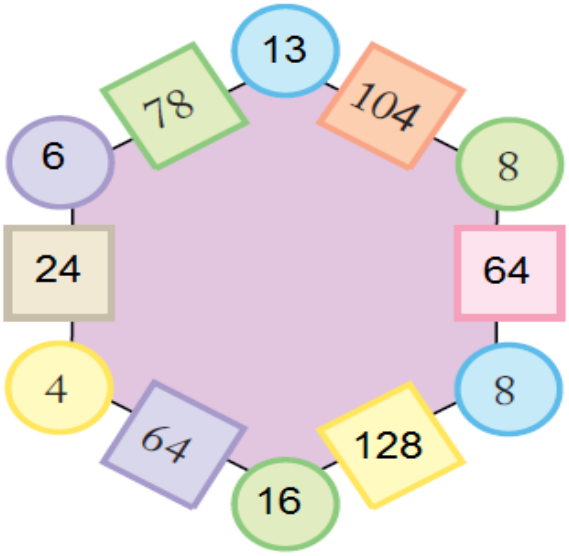
9 × 12 = 108

12 × 7 = 84

(b)



Solution:-



4 × 16 = 64

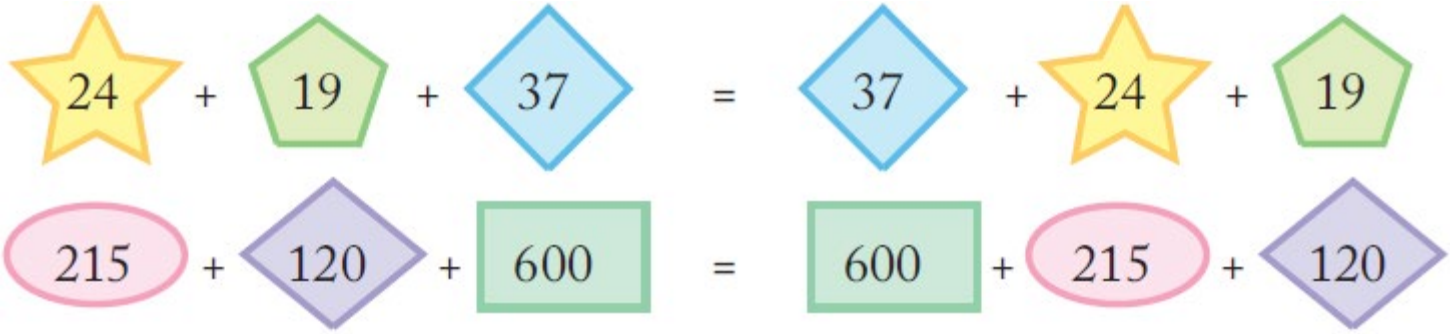
16 × 8 = 128

8 × 8 = 64

13 × 8 = 104

13 × 6 = 78

9. Numbers and Numbers



(i) Are they equal?

Solution:-

Yes, the mentioned equation are equal.

Let us consider the left-hand side (LHS) of the first equation = 24 + 19 + 37

LHS = 80

Now, the right-hand side (RHS) = 37 + 24 + 19

RHS = 80

By comparing LHS and RHS,

LHS = RHS

Then, consider second equation, LHS = 215 + 120 + 600

LHS = 935

Now, RHS = 600 + 215 + 120

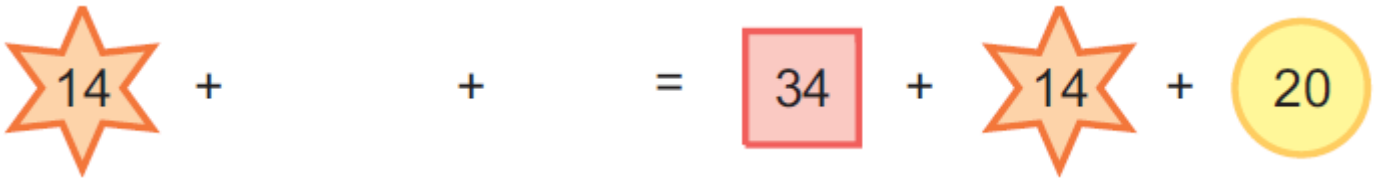
= 935

By comparing LHS and RHS,

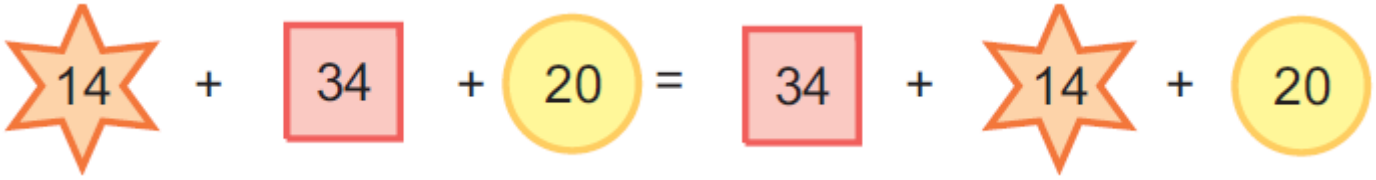
LHS = RHS

(ii) Fill in the blank spaces in the same way.

(a)

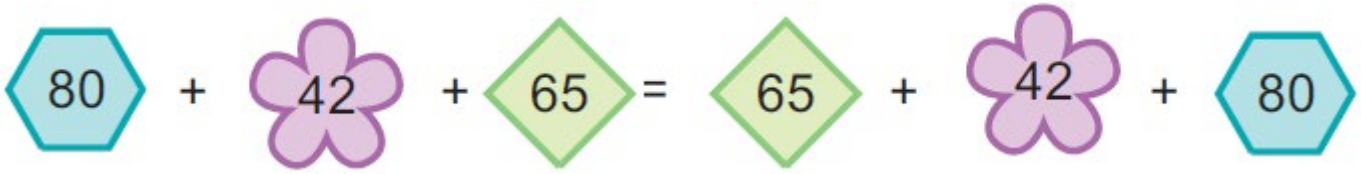


Solution:-

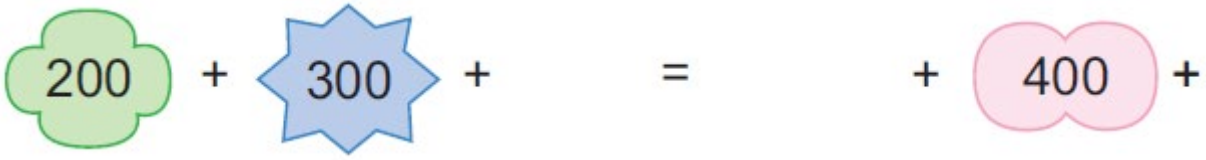


(b)

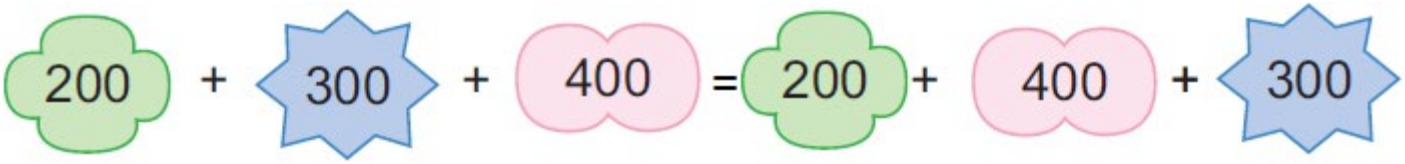
Solution:-



(c)



Solution:-



(iii) Now, look at this –

Check if it is true or not.

Solution:-

First, consider the left-hand side (LHS) = 48 × 13

LHS = 624

Now, consider the right-hand side (RHS) = 13 × 48

RHS = 624

By comparing LHS and RHS,

LHS = RHS

(iv) Now, you try and change these numbers into special numbers.

(a) 28

Solution:-

Take another number 28

Now, turn it back to front 82

Then, add them together 110

Is this a special number? No! Why not?

OK, carry on with the number 110

Again, turn it back to front 011

Then add the two together 121

Ah! 121 is a special number.

(b) 132

Solution:-

Take another number 132

Now, turn it back to front 231

Then add them together 363

Ah! 363 is a special number.

(c) 273

Solution:-

Take another number 273

Now, turn it back to front 372

Then add them together 645

Is this a special number? No! Why not?

OK, carry on with the number 645

Again, turn it back to front 546

Then add the two together 1191

Is this a special number? No! Why not?

OK, carry on with the number 1191

Again, turn it back to the front 1911

Then add the two together 3102

Is this a special number? No! Why not?

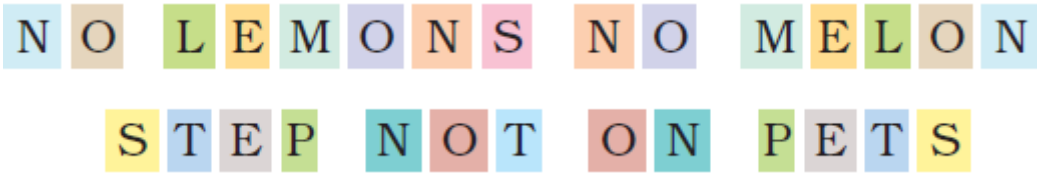
OK, carry on with the number 3102

Again, turn it back to the front 2013

Then add the two together 5115

Ah! 5115 is a special number.

(v) Now, let's use words in a special way.



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

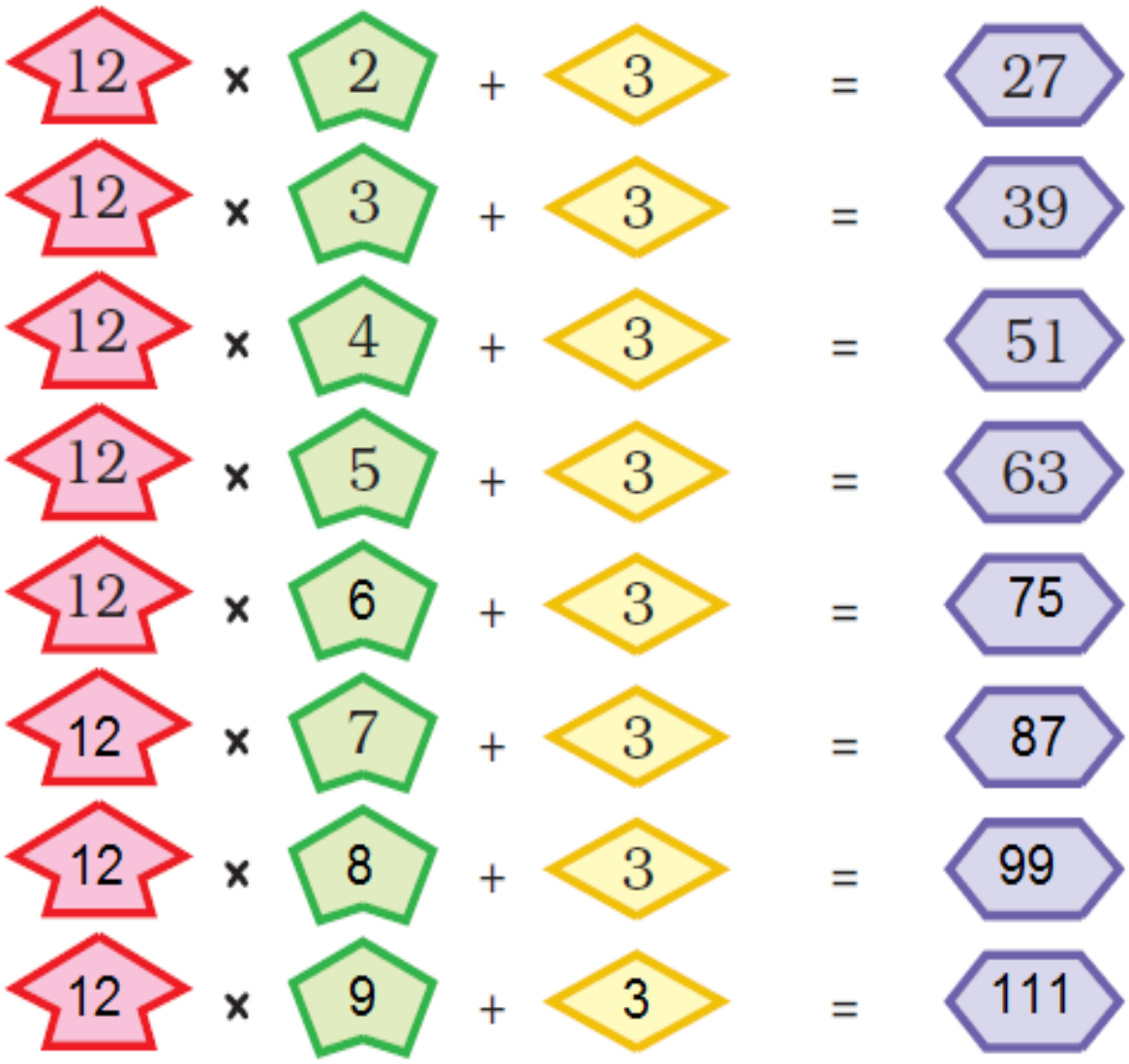
Solution:-

EYE, LEVEL, ROTATOR, NOON, REFER, TOP SPOT etc.

10. Some more Number Patterns

(i) 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?

Solution:-



Let us check difference in the answer, 39 – 27 = 12, 51 – 39 = 12, 63 – 51 = 12,

75 – 63 = 12, 87 – 75 = 12, 99 – 87 = 12, 111 – 99 = 12

Therefore, the difference in the answer is the same at every step.

(ii) Look at the numbers below. Look for the pattern. Can you take it forward?

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

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

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

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

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

(_____) $\div 8 =$ ____

(_____) $\div 8 =$ ____

Solution:-

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

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

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

$(9876 - 4) \div 8 = 1234$

$(98765 - 5) \div 8 = 12345$

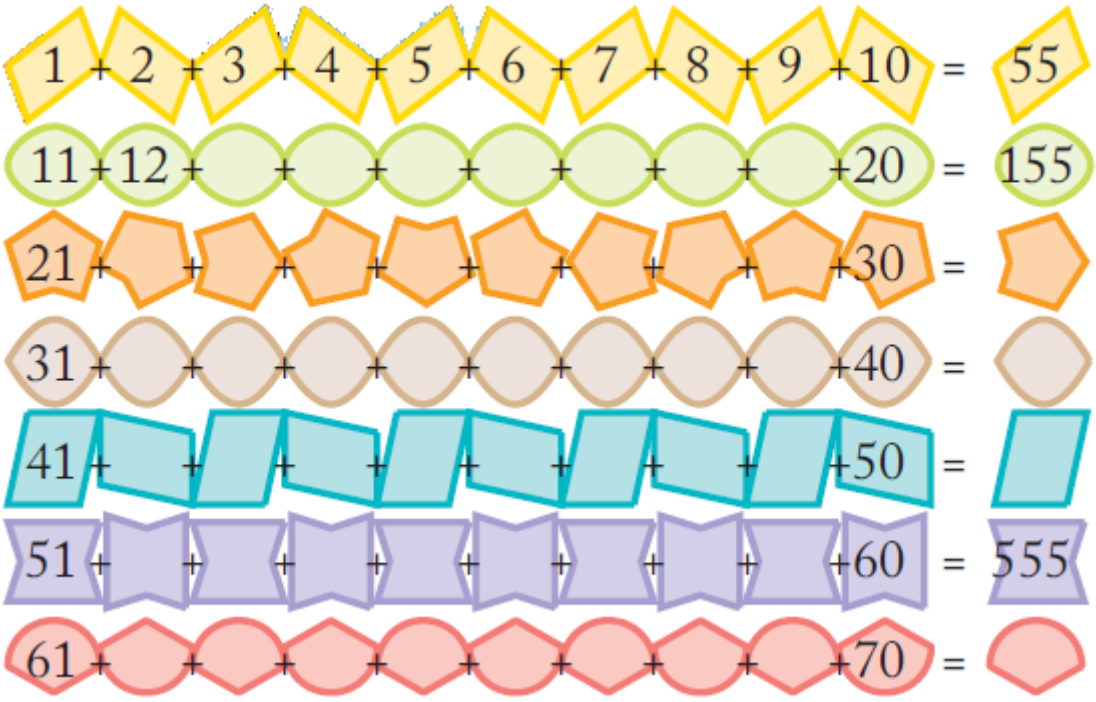
(987654 – 6) $\div 8 = 123456$

(9876543 – 7) $\div 8 = 1234567$

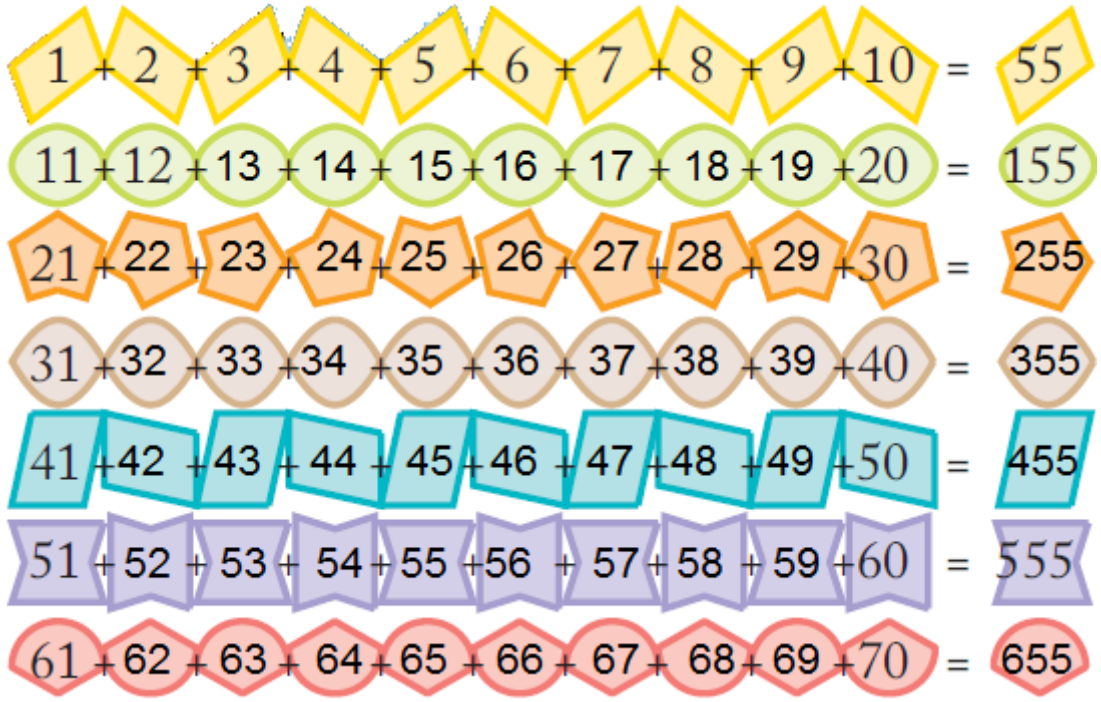
(98765432 – 8) $\div 8 = 12345678$

(987654321 – 9) $\div 8 = 123456789$

11. Smart Adding



Solution:-



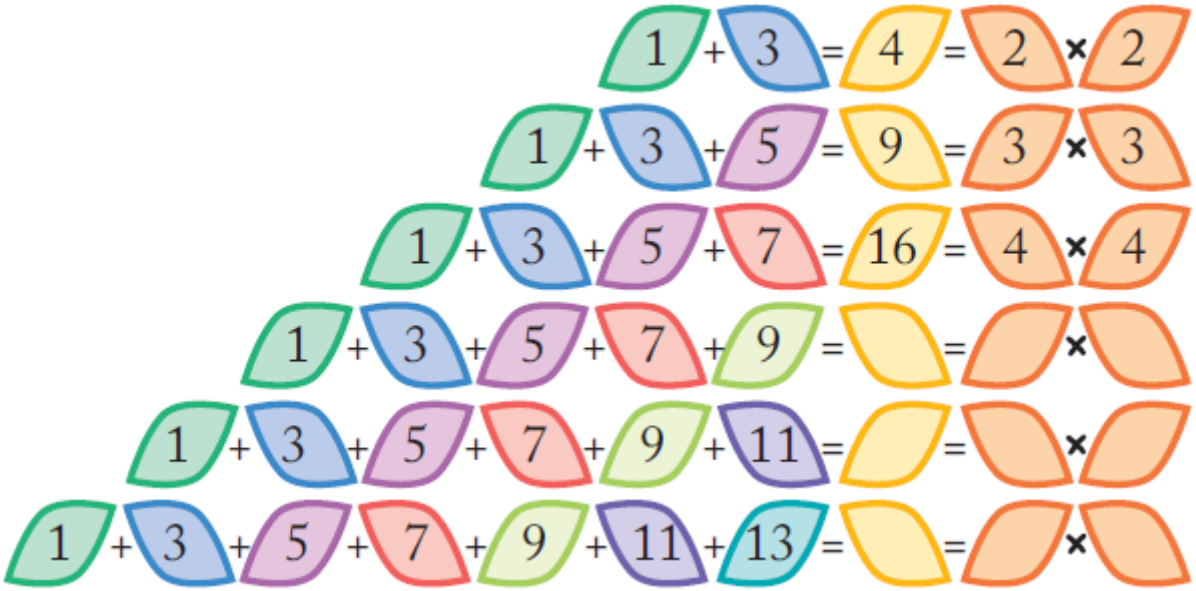
(ii) Did you notice some pattern in the answers?

Solution:-

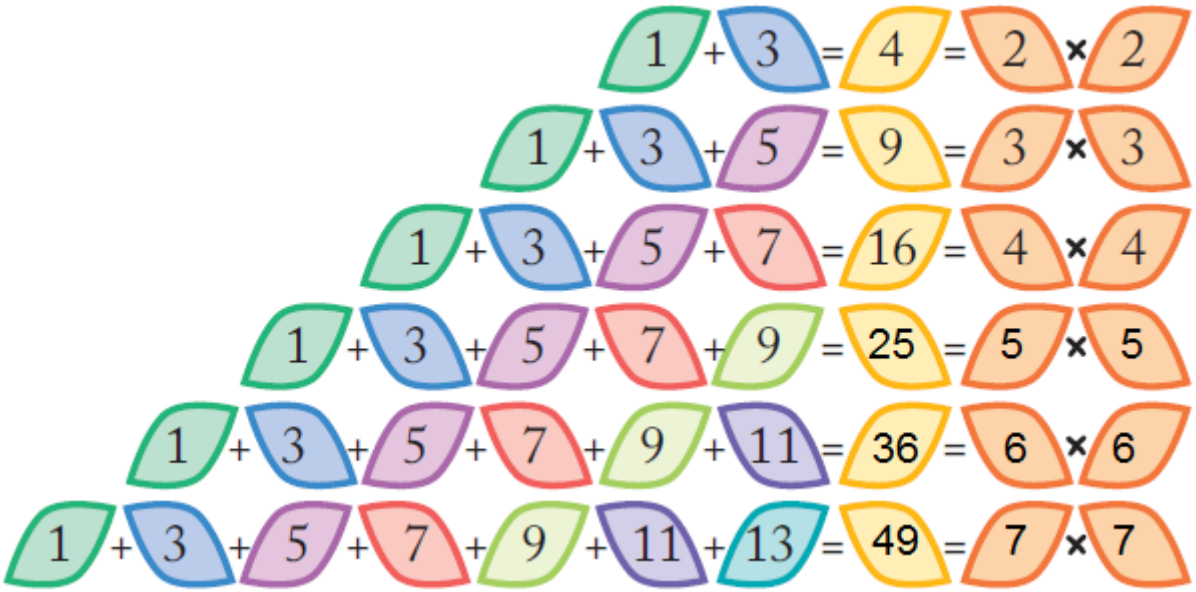
Yes, I found that the difference in the answer is the same, i.e., 100 at every step.

12. Fun with Odd Numbers

Take the first two odd numbers. Now, add them, and see what you get. Now, at every step, add the next odd number. How far can you go on?



Solution:-



We can't predict because there are infinite numbers.

13. Secret Numbers

Banno and Binod 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?

(i) 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

Solution:-

It is larger than half of 100, i.e. number > 100

It is more than 6 tens and less than 7 tens, so the number lies between 70 and 60

The tens digit is one more than the ones digit = 6 – 1 = 5

Together, the digits have a sum of 11 = 6 + 5 = 11

Therefore, the number is 65

(ii) 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 digit

Together, the digits have a sum of 6

Solution:-

It is smaller than half of 100 = number > 100

It is more than 4 tens and less than 5 tens = number lies between 40 and 50

The tens digit is two more than the ones digit = 4 – 2 = 2

Together, the digits have a sum of 6 = 4 + 2 = 6

Therefore, the number is 42

14. Number Surprises

a) Ask your friend to write — W 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?

Solution:-

Let us assume the age is 11.

Then, adding 5 to it, we get = 16

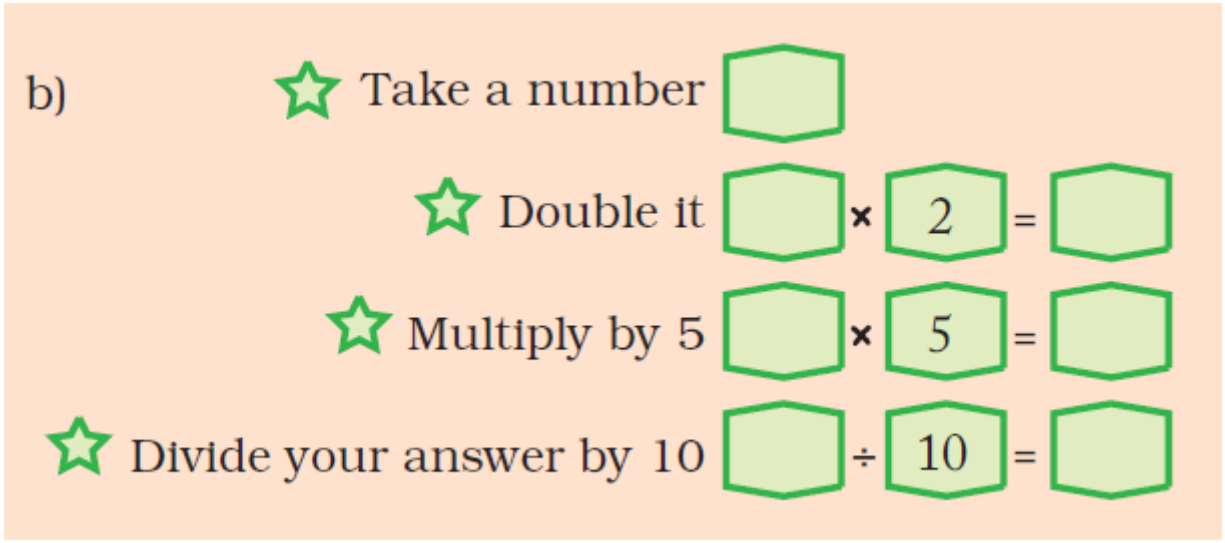
Multiply by 2, we get = 32

Subtract from 10, we get = 22

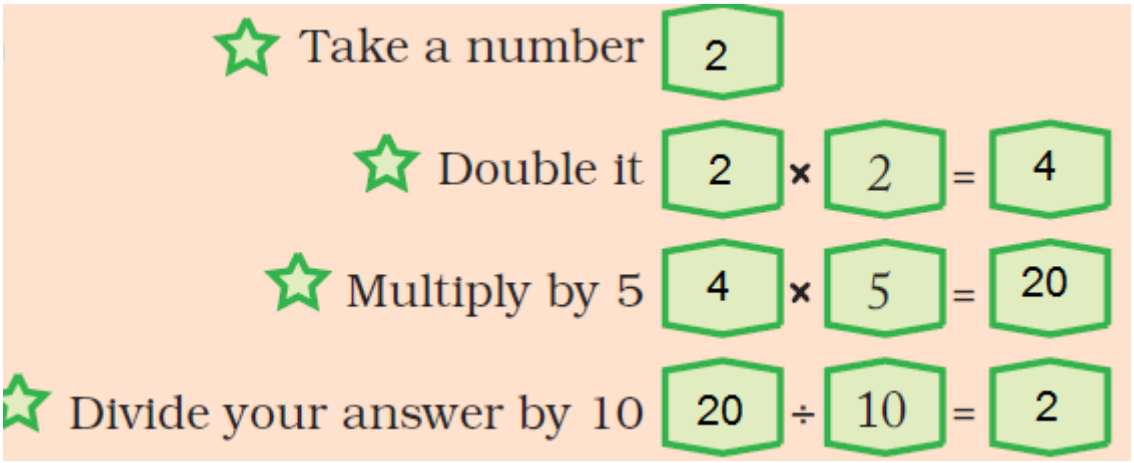
Divided by 2, we get = 11

Yes, my friend was really surprised.

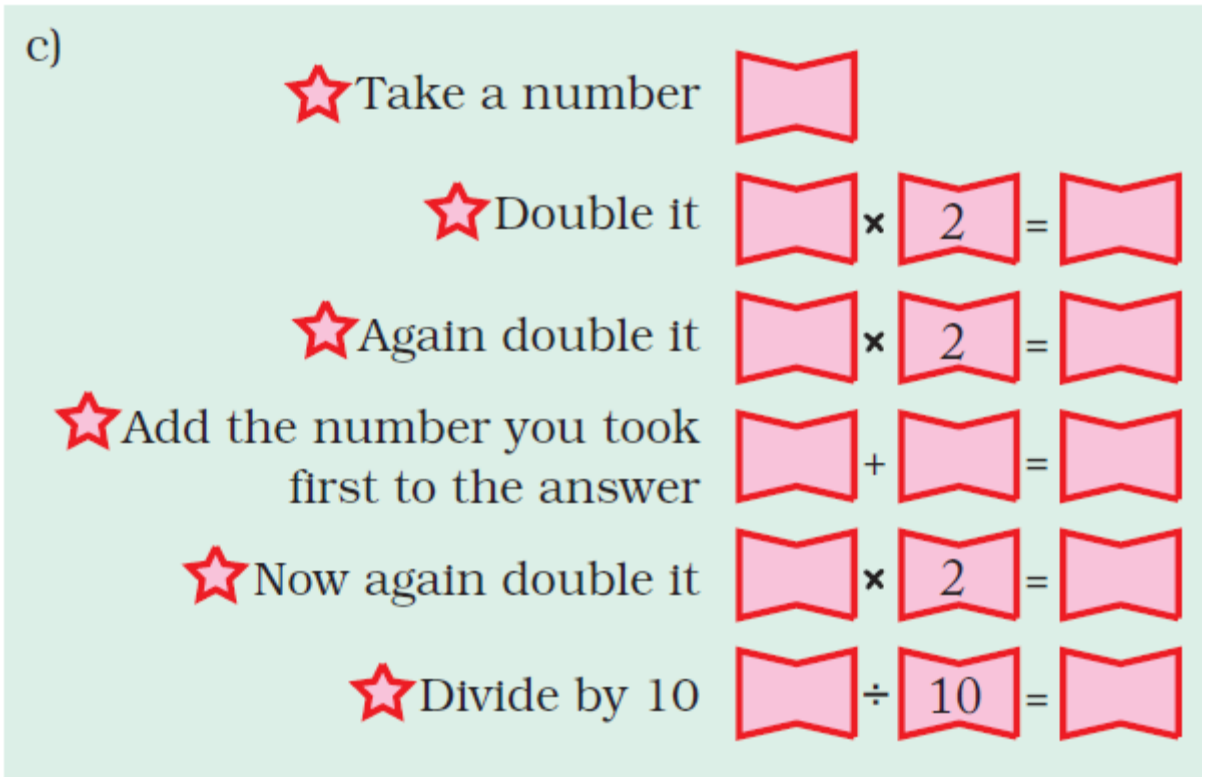
b)



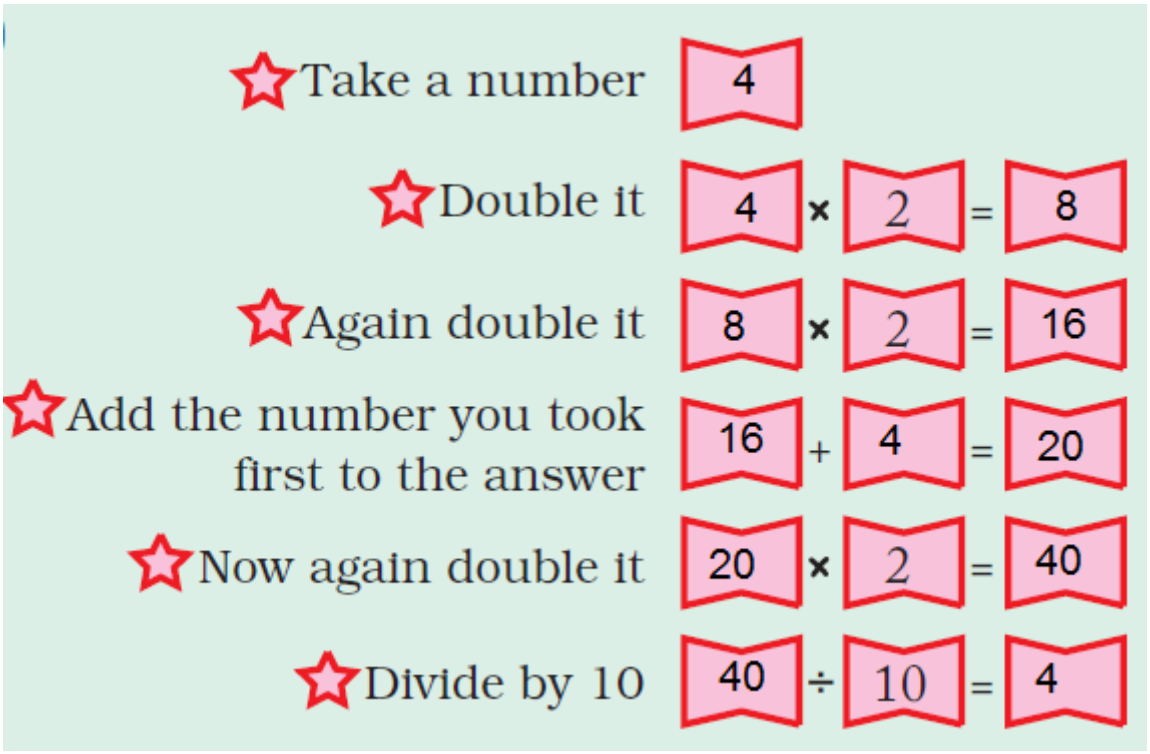
Solution:-



c)


Take a number
Double it
× 2 =
Again double it
× 2 =
Add the number you took first to the answer
+ =
Now again double it
× 2 =
Divide by 10
÷ 10 =

Solution:-


Take a number 4
Double it 4 × 2 = 8
Again double it 8 × 2 = 16
Add the number you took first to the answer 16 + 4 = 20
Now again double it 20 × 2 = 40
Divide by 10 40 ÷ 10 = 4

d) Look at this pattern of numbers and take it forward.

$$1 = 1 \times 1$$

$$121 = 11 \times 11$$

$$12321 = 111 \times 111$$

$$1234321 = ?$$

Solution:-

1 = 1 × 1

121 = 11 × 11

12321 = 111 × 111

1234321 = 1111 × 1111

123454321 = 11111 × 11111

12345654321 = 111111 × 111111

1234567654321 = 1111111 × 1111111

1234567654321 = 1111111 × 1111111

1234567654321 = 1111111 × 1111111