

15. [Number Patterns]

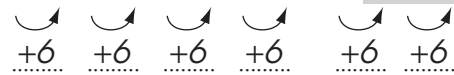
Skill 15.1 Completing number patterns by adding the same number.

MM3.2 1 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

- Find the number used to get from term to term.
- Find the operation used to get from term to term.

Hint: Every number pattern is created by a rule involving numbers and operations.

Q. 1, 7, 13, 19, 25, _ , _ **A.** 1, 7, 13, 19, 25, 31 , 37



Ask: ‘Are the numbers increasing or decreasing?’

‘How can you get from 1 to 7?’

Answer: To get from 1 to 7, add 6.

To get from 7 to 13, add 6.

To get from 13 to 19, add 6 and so on.

So the rule of the pattern is:

“Add 6 to the previous number.”

Apply this rule to the last given number.

$$25 + 6 = 31$$

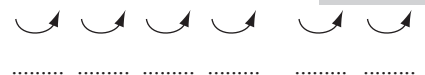
$$31 + 6 = 37$$

a) 5, 9, 13, 17, 21, 25 , 29



Rule: Add 4 to the previous number

b) 9, 14, 19, 24, 29, _ , _



Rule:

c) 8, 11, 14, 17, 20, _ , _



Rule:

d) 6, 16, 26, 36, 46, _ , _



Rule:

e) 3, 10, 17, 24, 31, _ , _



Rule:

f) 5, 14, 23, 32, 41, _ , _



Rule:

Skill 15.2 Completing number patterns by subtracting the same number.

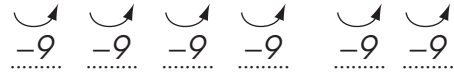
MM3.2 1 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

- Find the number used to get from term to term.
- Find the operation used to get from term to term.

Hint: Every number pattern is created by a rule involving numbers and operations.

q. 59, 50, 41, 32, 23, _ , _

A. 59, 50, 41, 32, 23, 14 , 5



Ask: ‘Are the numbers increasing or decreasing?’

‘How can you get from 59 to 50?’

Answer: To get from 59 to 50, subtract 9.

To get from 50 to 41, subtract 9.

To get from 41 to 32, subtract 9 and so on.

So the rule of the pattern is:

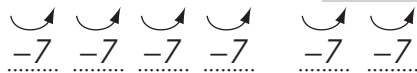
“*Subtract 9 from the previous number.*”

Apply this rule to the last given number.

$$23 - 9 = 14$$

$$14 - 9 = 5$$

a) 45, 38, 31, 24, 17, 10 , 3



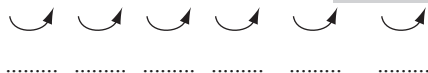
Rule: Subtract 7 from the previous number

b) 16, 14, 12, 10, 8, _ , _



Rule:

c) 42, 36, 30, 24, 18, _ , _



Rule:

d) 33, 28, 23, 18, 13, _ , _



Rule:

e) 51, 43, 35, 27, 19, _ , _



Rule:

f) 51, 47, 43, 39, 35, _ , _



Rule:

Skill 15.3 Completing number patterns by multiplying by the same number.

MM3.2 11 22 33 44
MM4.1 11 22 33 44

- Find the number used to get from term to term.
- Find the operation used to get from term to term.

Hint: Every number pattern is created by a rule involving numbers and operations.

Q.

1, 5, 25, 125, _ , _

A.

1, 5, 25, 125, **625 , 3125**

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ \times 5 & \times 5 & \times 5 & \times 5 & & \times 5 & \\ \hline & & & & & & \end{array}$

Ask: ‘Are the numbers increasing or decreasing?’

‘How can you get from 1 to 5?’

Answer: To get from 1 to 5, multiply by 5.
To get from 5 to 25, multiply by 5.
To get from 25 to 125, multiply by 5 etc.
So the rule of the pattern is:

“Multiply the previous number by 5.”

Apply this rule to the last given number.

$$125 \times 5 = 625$$

$$625 \times 5 = 3125$$

a)

2, 8, 32, 128, 512 , 2048

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ \times 4 & \times 4 & \times 4 & \times 4 & & \times 4 & \\ \hline & & & & & & \end{array}$

Rule: Multiply the previous number by 4

b)

1, 2, 4, 8, _ , _

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ & & & & & & \\ \hline & & & & & & \end{array}$

Rule:

c)

1, 3, 9, 27, _ , _

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ & & & & & & \\ \hline & & & & & & \end{array}$

Rule:

d)

9, 18, 36, 72, _ , _

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ & & & & & & \\ \hline & & & & & & \end{array}$

Rule:

e)

$\frac{1}{2}$, 2, 8, 32, _ , _

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ & & & & & & \\ \hline & & & & & & \end{array}$

Rule:

f)

0.2, 1, 5, 25, _ , _

$\begin{array}{ccccccc} \curvearrowright & \curvearrowright & \curvearrowright & \curvearrowright & & \curvearrowright & \\ & & & & & & \\ \hline & & & & & & \end{array}$

Rule:

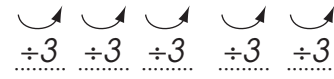
Skill 15.4 Completing number patterns by dividing by the same number.

MM3.2 11 22 33 44
MM4.1 11 22 33 44

- Find the number used to get from term to term.
- Find the operation used to get from term to term.

Hint: Every number pattern is created by a rule involving numbers and operations.

Q. 81, 27, 9, 3, _ , _ **A.** 81, 27, 9, 3, 1 , $\frac{1}{3}$



Ask: ‘Are the numbers increasing or decreasing?’
 ‘How can you get from 81 to 27?’

Answer: To get from 81 to 27, divide by 3.
 To get from 27 to 9, divide by 3.
 To get from 9 to 3, divide by 3 and so on.
 So the rule of the pattern is:
 “Divide the previous number by 3.”
 Apply this rule to the last given number.
 $3 \div 3 = 1$
 $1 \div 3 = \frac{1}{3}$

a) 64, 32, 16, 8, 4 , 2

Rule: Divide the previous number by 2

b) 224, 112, 56, 28, _ , _

Rule:

c) 4096, 1024, 256, 64, _ , _

Rule:

d) 3750, 750, 150, _ , _

Rule:

e) 972, 324, 108, 36, _ , _

Rule:

f) 45, 15, 5, $\frac{5}{3}$, _ , _

Rule:

