

# PA4-18: Describing and Creating Patterns

In this sequence, each number is greater than the one before it: 7, 8, 10, 15, 21

The sequence is always increasing.

In this sequence, each number is less than the one before it: 25, 23, 18, 11, 8

The sequence is always decreasing.

1. Write a + sign in the circle to show where the sequence increases.

Write a - sign to show where it decreases.

a) 6, 9, 7, 11

+     -     +

b) 1, 5, 7, 2

      

c) 10, 7, 6, 8

      

d) 2, 5, 1, 7

      

e) 5, 3, 9, 8

      

f) 2, 5, 9, 12

      

g) 2, 7, 4, 9

      

h) 11, 15, 18, 13

      

i) 18, 13, 11, 23

      

j) 28, 36, 49, 52

      

k) 17, 38, 29, 85

      

l) 53, 64, 96, 98

      

2. Write a + sign in the circle to show where the sequence increases.

Write a - sign to show where it decreases. Then write ...

... an **A** beside the sequence if it increases

... a **B** beside the sequence if it decreases

... a **C** beside the sequence if it increases and decreases.

a) 4, 8, 3, 7

+     -     +

\_\_\_\_\_ **C** \_\_\_\_\_

b) 7, 5, 3, 2

      

\_\_\_\_\_

2, 8, 9, 11

      

\_\_\_\_\_

8, 6, 3, 9

      

\_\_\_\_\_

10, 9, 4, 1

      

\_\_\_\_\_

1, 4, 7, 11

      

\_\_\_\_\_

c) 3, 4, 6, 8

      

\_\_\_\_\_

d) 17, 14, 12, 10

      

\_\_\_\_\_

8, 4, 2, 7

      

\_\_\_\_\_

20, 24, 15, 29

      

\_\_\_\_\_

9, 5, 1, 0

      

\_\_\_\_\_

23, 29, 34, 40

      

\_\_\_\_\_

# PA4-19: Describing and Creating Patterns (Advanced)

1. Find the amount by which the sequence increases or decreases.  
 (Write a number with a + sign if the sequence increases, and a - sign if it decreases.)

a)  $\overset{+4}{\circ}$  3,  $\overset{-2}{\circ}$  7,  $\overset{+7}{\circ}$  5,  $\overset{-4}{\circ}$  12, 8

b)  $\circ$  2,  $\circ$  5,  $\circ$  4,  $\circ$  8, 5

c)  $\circ$  3,  $\circ$  6,  $\circ$  7,  $\circ$  11, 13

d)  $\circ$  4,  $\circ$  2,  $\circ$  6,  $\circ$  2, 9

e)  $\circ$  2,  $\circ$  8,  $\circ$  9,  $\circ$  4, 12

f)  $\circ$  18,  $\circ$  15,  $\circ$  11,  $\circ$  13, 12

g)  $\circ$  16,  $\circ$  11,  $\circ$  13,  $\circ$  18, 15

h)  $\circ$  28,  $\circ$  31,  $\circ$  24,  $\circ$  31, 38

2. Match each sequence with the sentence that describes it. This sequence ...

a) A ... increases by 3 each time.

b) A ... increases by 4 each time.

B ... increases by different amounts.

B ... increases by different amounts.

\_\_\_ 9, 12, 15, 18, 21

\_\_\_ 6, 10, 14, 17, 21

\_\_\_ 7, 10, 13, 14, 19

\_\_\_ 5, 9, 13, 17, 21

c) A ... decreases by 5 each time.

d) A ... decreases by different amounts.

B ... decreases by different amounts.

B ... decreases by the same amount.

\_\_\_ 35, 30, 25, 20, 15

\_\_\_ 10, 9, 8, 6, 5

\_\_\_ 30, 25, 20, 15, 5

\_\_\_ 11, 10, 9, 8, 7

### BONUS

e) A ... increases by 5 each time.

f) A ... increases and decreases.

B ... decreases by different amounts.

B ... increases by the same amount.

C ... increases by different amounts.

C ... decreases by different amounts.

D ... decreases by the same amount.

\_\_\_ 17, 22, 28, 32, 34

\_\_\_ 21, 19, 15, 13, 9

\_\_\_ 17, 14, 10, 9, 6

\_\_\_ 10, 13, 9, 7, 5

\_\_\_ 14, 19, 24, 29, 34

\_\_\_ 19, 17, 15, 13, 11

\_\_\_ 9, 12, 15, 18, 21

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3. Write a rule for each pattern. Use the words add or subtract, and be sure to say what number the pattern starts with.

a) 2  $\overset{+4}{\circ}$ , 6  $\overset{+4}{\circ}$ , 10  $\overset{+4}{\circ}$ , 14

Start at 2, add 4

b) 3  $\circ$ , 5  $\circ$ , 7  $\circ$ , 9  $\circ$

c) 19  $\circ$ , 16  $\circ$ , 13  $\circ$ , 10  $\circ$

4. Write a rule for each pattern.

NOTE: One sequence doesn't have a rule – see if you can find it.

a) 8, 11, 14, 17

b) 14, 10, 6, 2

c) 25, 21, 18, 17, 11

d) 61, 65, 69, 73

5. Describe each pattern as increasing, decreasing or repeating.

a) 1, 4, 7, 10, 13, 16

b) 1, 5, 8, 1, 5, 8

c) 9, 8, 7, 6, 5, 4

d) 2, 4, 6, 8, 10, 12

e) 3, 8, 3, 8, 3, 8

f) 21, 16, 10, 7, 5, 1



6. Write the first five numbers in each of the patterns described.

a) Start at 6, add 3

b) Start at 26, subtract 4

c) Start at 39, add 5

7. Create an increasing or a decreasing number pattern. Give the rule for your pattern.

8. Create a repeating pattern using... a) letters    b) shapes    c) numbers

9. Create a pattern and ask a friend to find the rule for your pattern.