Arithmetic Sequences

Write and explicit rule that describes the number of items used to construct the pattern in terms of the term number, *n*.

1.

SOLUTION:

The first one has 4 blocks.

The second one has 6 blocks.

The third one has 8 blocks.

The fourth one has 10 blocks.

4, 6, 8, 10, ... the number of blocks is increasing by 2

so there has to be a + 2n

Since the first one has 4 and there is a + 2(1), then it should have started with 2.

So, to get the first one, it should be 2 + 2n.

ANSWER:

2 + 2n

3.

SOLUTION:

The first one has 3 sticks.

The second one has 5 sticks.

The third one has 7 sticks.

The fourth one has 9 sticks.

3, 5, 7, 9, ... the number of sticks is increasing by 2

so there has to be a + 2n

Since the first one has 3 and there is a + 2(1), then it should have started with 1.

So, to get the first one, it should be 1 + 2n.

ANSWER:

1 + 2n

Finance

Segway Tours in Corpus Christi charges $12 an hour to rent a Segway and an additional fee of $4 for the required helmet. David can create an arithmetic sequence that shows the cost of renting a Segway.

16, 28, 40, 52, ...

5. How much will David spend to rent the Segway with a helmet for 6 hours?

SOLUTION:

Since they are going by 12, then the fifth one should be 64 and the sixth one should be 76.

ANSWER:

76

6. Write a function rule that describes the cost of renting a Segway, *f(n),* in terms of the number of hours, *n*, David rents the Segway.

SOLUTION:

Since it is $4 for a helmet and $12 an hour to rent the Segway, then it should be 4 + 12n.

ANSWER:

4 + 12n

Finance

Clayton opens a savings account with $11 he got from his grandmother. Each month after the initial deposit, he adds $15 to the account. Clayton can create an arithmetic sequence that shows the balance of his savings account at the end of each month after he deposits funds in the savings account.

26, 41, 56, ...

9. How much money will Clayton have in his account after he deposits money for 12 months?

SOLUTION:

Since he deposits $15 12 times, that is a total of $180. He started with $11, so 11 + 180 = 191

ANSWER:

$191

10. Write an explicit rule that describes the amount of money in Clayton's account, a_n, in terms of the number of months, n, he deposits money.

SOLUTION:

Since he deposits $15 every month, that is 15n. He started with $11, so that should give us 11 + 15n.

ANSWER:

a_n = 11 + 15n

Write a recursive rule and an explicit rule.

11. 1, 8, 15, 22, 29, …

SOLUTION:

Recursive: each number results from adding 7 to the previous number, and the first number, a_1 = 1.
So, $a_n = a_{n-1}$ + 7.

Explicit: the difference between each number is 7, but the first number is 1. So, to get from 7 to 1 you must subtract 6. So, a_n = 7n − 6.

ANSWER:

Recursive: a_1 = 1; $a_n = a_{n-1}$ + 7

Explicit: a_n = 7n − 6

13. -10, -6.5, -3, 0.5, 4, 7.5, …

SOLUTION:

Recursive: each number results from adding 3.5 to the previous number, and the first number, a_1 = -10.
So, $a_n = a_{n-1}$ + 3.5.

Explicit: the difference between each number is 3.5, but the first number is -10. So, to get from 3.5 to -10 you must subtract -13.5. So, a_n = 3.5n − 13.5.

ANSWER:

Recursive: a_1 = -10; $a_n = a_{n-1}$ + 3.5

Explicit: a_n = 3.5n − 13.5

16. 147, 127, 107, 87, 67, …

SOLUTION:

Recursive: each number results from subtracting 20 from the previous number, and the first number, a_1 = 147. So, $a_n = a_{n-1}$ − 20.

Explicit: the difference between each number is -20, but the first number is 147. So, to get from -20 to 147 you must add 167. So, a_n = -20n + 167.

ANSWER:

Recursive: a_1 = 147; $a_n = a_{n-1}$ − 20

Explicit: a_n = -20n + 167