Sequences (Part 1) – Lesson

MCR3U

Jensen

DO IT NOW!

How much can you figure out about this list of numbers?

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233,...

Definitions

Formula for general term (explicit formula):

Sequence:

Example 1: Write the first three terms of each sequence, given the explicit formula for the *n*th term of the sequence.

a) $t_n = 3n^2 - 1$

b) $t_n = \frac{n-1}{n}$

Arithmetic Sequences

Examples of sequences:

a) 14, 18, 22, 26,...

b) 7, 3, -1, -5,...

These are called ***arithmetic*** sequences because they increase by a constant difference (+ or -)

Formula for the general term of an arithmetic sequence

$\boldsymbol{n}$**:** $\boldsymbol{a}$**:**

$\boldsymbol{t_n}$**:** $\boldsymbol{d}$**:**

Example 2

a) Determine a formula for the general term of the following arithmetic sequence.

14, 18, 22, 26,...

b) What is the value of t_{30}

Example 3

a) Determine a formula for the general term of the following arithmetic sequence.

7, 3, -1, -5,…

b) What is the value of t_{41}

Geometric Sequences

Examples of sequences:

a) 2, 6, 18, 54,…

b) 80, 40, 20, 10,…

These are called ***geometric*** sequences because the ratio of consecutive terms is constant.

Formula for the General Term of a Geometric Sequence

$\boldsymbol{n}$**:** $\boldsymbol{a}$**:**

$\boldsymbol{t_n}$**:** $\boldsymbol{r}$**:**

Example 4:

a) Determine a formula for the general term of the following geometric sequence.

2, 6, 18, 54, 162,...

b) What is the value of t_9

Example 5:

a) Determine a formula for the general term of the following geometric sequence.

270, 90, 30, 10,...

b) What is the value of t_9