Function Notation

Evaluate $y = 5x + 1$ when $x = 2$

$y = 5(2) + 1$

$y = 11$

$(x, y) \rightarrow (2, 11)$

$(n, f(n))$ — f of n

$f(n)$ is the value of the function at n.

$f(n) = 5n + 1$ find $f(2)$ what is the value of the function at 2?

$f(2) = 5(2) + 1$

$f(2) = 11$

Given $f(n) = 8n - 3$ and $g(n) = 3n - 10$, evaluate the following:

1) $f(5) = 8n - 3$

$= 8(5) - 3$

$= 37$

2) $g(5) = 3n - 10$

$= 3(5) - 10$

$= 5$

Sequences

Sequence - A list of numbers

Ex: 1, 5, 9, 13, ... (fourth term)

(first term)

Term - each number in a sequence.

Arithmetic Sequence - Add/subtract the same number repeatedly
- Common Difference (d)

Ex: 1, 5, 9, 13 ... Common difference = 4

+4

d = 2nd term − 1st term

Geometric Sequence - Repeated multiplication and division.
- Common Difference (r)

Ex: 3, 6, 12, 24 Common ratio = 2

·2

$r = \frac{\text{2nd term}}{\text{1st term}}$

Formula Definition

Recursive Formula - A formula that is dependent on the previous term.

Previous Term - $f(n-1)$

2 Parts - 1) where it starts
2) how to get to the next term

Arithmetic: 9, 7, 5, 3, ... $d=-2$

(9 → 7: -2)

$f(1)=9$ $f(n)=f(n-1)-2$

($f(1)$: first term; $f(n-1)$: previous term)

$f(0)=\#$
$f(n)=f(n-1)+d$

or

$f(1)=\#$
$f(n)=f(n-1)+d$

Geometric: 5, 10, 20, 40...

(5 → 10: ·2)

$f(1)=5$ $f(n)=2f(n-1)$

$f(0)=\#$
$f(n)=rf(n-1)$

or

$f(1)=\#$
$f(n)=rf(n-1)$

Explicit - not dependent on the previous term.

Arithmetic: 9, 7, 5, 3, ... $d=-2$

-2

$f(n) = 9 - 2(n-1)$

$f(n) = f(1) + d(n-1)$

or

$f(n) = f(0) + dn$

Geometric: 5, 10, 20, 40, ...

·2

$f(n) = 5(2)^{n-1}$

$f(n) = f(1)(r)^{n-1}$

or

$f(n) = f(0)(r)^{n}$