More Recursive Rules

→ 5ᵗʰ term

4) If a sequence is defined recursively by f(1) = 10 and f(n) = -f(n-1) + 3 then find f(5).

$f(1) = 10$

$f(2) = -f(1) + 3$
$f(2) = -10 + 3 = -7$
$f(2) = -7$

$10, -7, 10, -7 \boxed{10}$

$f(3) = -f(2) + 3$
$= -(-7) + 3 = 7 + 3 = 10$

$f(4) = -f(3) + 3$
$= -(10) + 3 = -7$

$f(5) = -f(4) + 3$
$-(-7) + 3 = 7 + 3 = 10$

5) A sequence is defined recursively by adding 4 to twice the value of the previous term. Write a recursive rule for this sequence if the first term is 15.

① $a_1 = 15$

② $a_n = 2a_{n-1} + 4$

① $f(1) = 15$

② $f(n) = 2f(n-1) + 4$

CONCLUSION!

When creating a sequence using a **recursive rule**, it is important to understand that

each term of the sequence is found using the ___PREVIOUS___ term. If the

nth term of the sequence is denoted by a_n then the previous term is ___a_{n-1}___.

$a_0 \quad a_1 \quad a_2$
$1, 1, 2$

APPLICATION QUESTION!

One of the most famous sequences in mathematics is The Fibonacci Sequence. It is defined recursively as follows: $a_n = a_{n-1} + a_{n-2}$; $a_0 = 1$ and $a_1 = 1$. Using this rule, find the first five terms of the sequence.

$a_n = a_{n-1} + a_{n-2}$
$a_2 = a_{2-1} + a_{2-2}$
$a_2 = a_1 + a_0$
$a_2 = 1 + 1$
$\boxed{a_2 = 2}$