

Name: _____

The $3x + 1$ problem.

The Problem.

If n is odd, multiply by three and add one. If n is even, divide by two. What happens?

I try a couple cases.

$5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow 1 \rightarrow 4 \rightarrow 2 \rightarrow 1 \rightarrow \dots$

$7 \rightarrow 22 \rightarrow 11 \rightarrow 34 \rightarrow 17 \rightarrow 52 \rightarrow 26 \rightarrow 13 \rightarrow 40 \rightarrow 20 \rightarrow 10 \rightarrow 5 \rightarrow ?$

You try a few cases.

$9 \rightarrow$

$13 \rightarrow$

$24 \rightarrow$

$80 \rightarrow$

$25 \rightarrow$

$19 \rightarrow$

$128 \rightarrow$

In general?