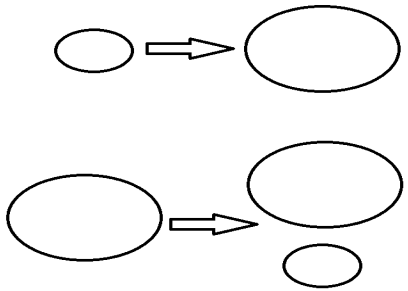
The catchphrase of the dynamicist: "If it's worth doing once, it's worth doing infinitely many times."

Fibonacci Numbers

A yeast bud takes one time unit to mature. A mature yeast bud takes one time unit to produce one new yeast bud. If you begin with a single immature yeast bud, and they are allowed to reproduce without obstruction, how many immature buds and mature yeast cells will you have after two time units? What about after two hundred?

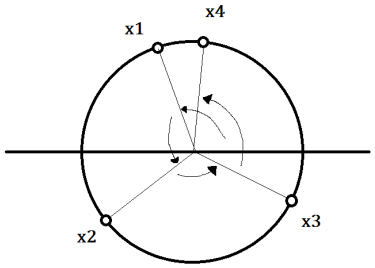


Sequence Coding

Consider:

$$x_n = \sin\left(2n\pi\sqrt{2}\right)$$

This sequence contains both infinitely many positive and infinitely many negative numbers, but which are which? Can we determine whether the 300th term of this sequence is positive or negative… *without using a calculator?*



Infinite Chess Games

A game of chess is considered a draw if:

The board is arranged in position P, player A makes a particular move M, the board returns to position P, the board returns to position P again by the exact same sequence of moves as before, and then player A makes move M again.

Is it possible for a game of chess to last forever, without reaching a draw?

These are all examples of...

SUBSTITUTION DYNAMICS

Come see how one single mathematical device can be used to answer all three of these questions: nothing more than an abstract game in swapping symbols around.

No background beyond arithmetic is required.

(Don't worry, the second problem doesn't really involve any trigonometry.)

Thursday, November 19

Common Hour—Lunch provided

NAB 2125

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