Recursion

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AP Computer Science, 2020-04-01

Divide and Conquer

A common algorithm used to solve things in the real world.

When faced with a large task you would divide it up into smaller chunks, and then complete each chunk one at a time.

For example:
You are assigned a large project for math class about the different curve equations, so you divide the project into sections:
Linear, Polynomial, and Exponential

Recursion

Recursion is when an action is repeated over and over again, each time with a different variable which is influenced by the previous repetition of the action.

For example:
You wrote an essay in English class, and now it will be reviewed by multiple peers. Each peer applies their changes and passes the essay along to the next. The process is done when the essay has been reviewed by a certain number of people.

Piecewise Functions

A piecewise function is a function that's actually made of multiple functions. Which function is applied depends on the input and the conditional statements.

$$f(x) = \begin{cases} -x + 1, & x < -1 \\ f(x-1), & x \geq -1 \end{cases}$$

In this function, if x is less than -1 then the output is -x + 1
If x is equal to or greater than -1, the output is f(x-1), calling the function again

S-S-S Algorithm

You can find the answer to a Piecewise function by using the S-S-S algorithm: Simplify, Substitute, and Solve.

- Simplify the expression through a series of intermediate calculations until the base case is reached.
- Substitute the base case in the last unsolved expression.
- Solve the remaining unsolved expressions until the final answer is found.