CodeHS

Computational vs. Algorithms

Discussion

A *computational algorithm* is a step-by-step procedure for solving a well-defined problem. But algorithms exist in all different fields of study. For example, a *mathematical algorithm* can be described as a set of steps that can be used to solve a mathematical computation. No matter the type, an algorithm can be constructed using combinations of sequencing (steps), selection (conditions), and iteration (repetition).

Example

General Algorithm	Mathematical Algorithm	Computational Algorithm

Directions to School
1. Leave the house and turn left.
2. At the second traffic light, turn right.
3. After the railroad tracks, turn right.
4. School is on your left.
	Distributive Property
	
	`a(b + c) = ab + ac`
	
	1. Multiply the outside term and the first term in the parenthesis.
	2. Multiply the outside term and the second term in the parenthesis.
	3. Add the results together
		Prints cost of purchase
		
		JavaScript
		`function main() {`
		`  let price = 15;`
		`  let num = readInt("Number: ");`
		
		`  let total = num * price;`
		`  console.log("Total: " + total);`
		`}`
		
		`main();`

Exercise
Create your own example of a general algorithm, a mathematical algorithm, and a computer algorithm.

General Algorithm	Mathematical Algorithm	Computational Algorithm

Challenge
A computational algorithm can also be a mathematical algorithm! Translate the following mathematical algorithms into computational algorithms.

Mathematical Algorithm	Computational Algorithm
Distributive Property `a(b + c) = ab + ac` 1. Multiply the outside term and the first term in the parenthesis. 2. Multiply the outside term and the second term in the parenthesis. 3. Add the results together	
FOIL `(a + b)(c + d) = ac + ad + bc + bd` 1. Multiply the first terms in the parenthesis. 2. Multiply the two terms on the outside. 3. Multiply the inside terms. 4. Multiply the last terms. 5. Add all the results together.	