3) (10 pts) ALG (Stack)
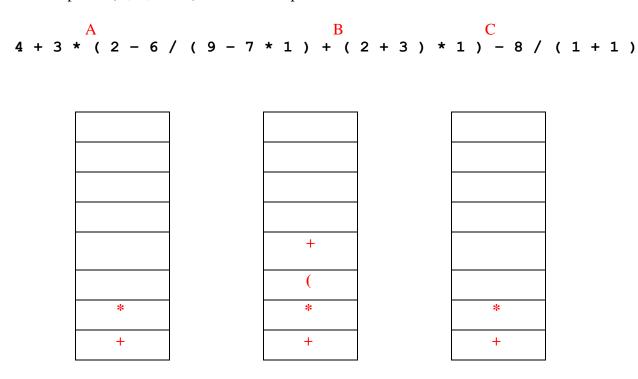
Convert the following infix expression to postfix using a stack. Show the contents of the stack at the indicated points (A, B, and C) in the infix expression.

```
         A                                    B                    C
 4 + 3 * ( 2 - 6 / ( 9 - 7 * 1 ) + ( 2 + 3 ) * 1 ) - 8 / ( 1 + 1 )
```

A
*
+

A

B
+
(
*
+

B

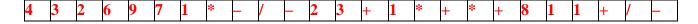| C |
|---|
| |
| |
| |
| |
| |
| |
| * |
| + |

C

Note: A indicates the location in the expression **AFTER** the multiplication and before the open parenthesis. B indicates the location in the expression **AFTER** the addition and before the open parenthesis. C indicates the location in the expression **AFTER the** close parenthesis and before the subtraction.

Resulting postfix expression:

4	3	2	6	9	7	1	*	-	/	-	2	3	+	1	*	+	*	+	8	1	1	+	/	-

Grading: 2 pts for each stack, 4 pts for the total expression. Give partial as necessary.

Computer Science Foundation Exam

August 26, 2023

Section B

ADVANCED DATA STRUCTURES

**NO books, notes, or calculators may be used,
and you must work entirely on your own.**

SOLUTION

Question #	Max Pts	Category	Score
1	10	DSN	
2	10	DSN	
3	5	ALG	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and <u>not</u> graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all <u>be neat</u>. For each coding question, assume that all of the necessary includes (stdlib, stdio, math, string) for that particular question have been made.