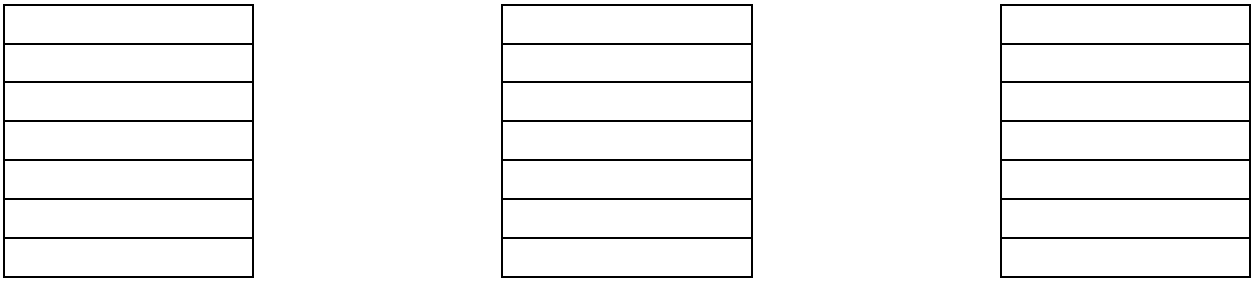
## COP 3502H: Homework Assignment - Stack Applications

1) Use a stack to evaluate the postfix expression below. Please show the state of the stack at the exact point in time during the algorithm that the marked (A, B, C) locations are reached while processing the expression. Also, write down the equivalent infix expression, placing parentheses when necessary.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **A** | | | | **B** | | | | | **C** | |
| **5** | **8** | **3** | ***** | **+** | **6** | **+** | **7** | **/** | **4** | **2** | **–** | ***** | | |



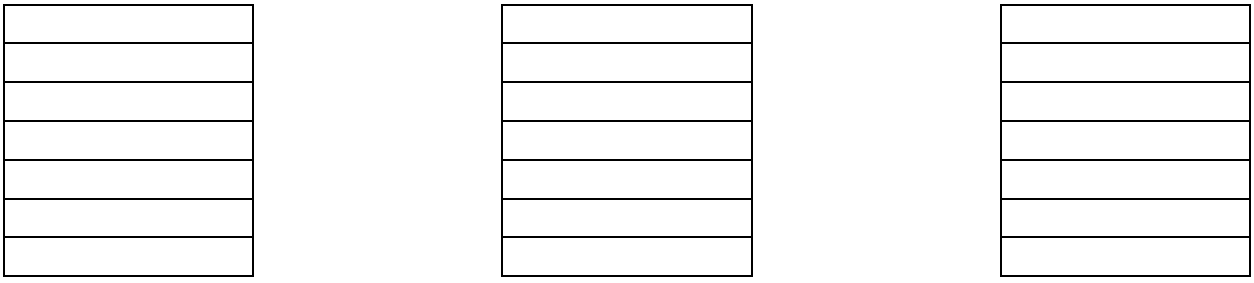
A B C

Value of the Expression: _____

Equivalent Infix Expression: _____

2) Use a stack to evaluate the postfix expression below. Please show the state of the stack at the exact point in time during the algorithm that the marked (A, B, C) locations are reached while processing the expression. Also, write down the equivalent infix expression, placing parentheses when necessary.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **A** | | | | **B** | | | | **C** | | | |
| **2** | **6** | **8** | ***** | **2** | **5** | ***** | **3** | **1** | **-** | **+** | **/** | **9** | **3** | **/** | **+** | ***** |



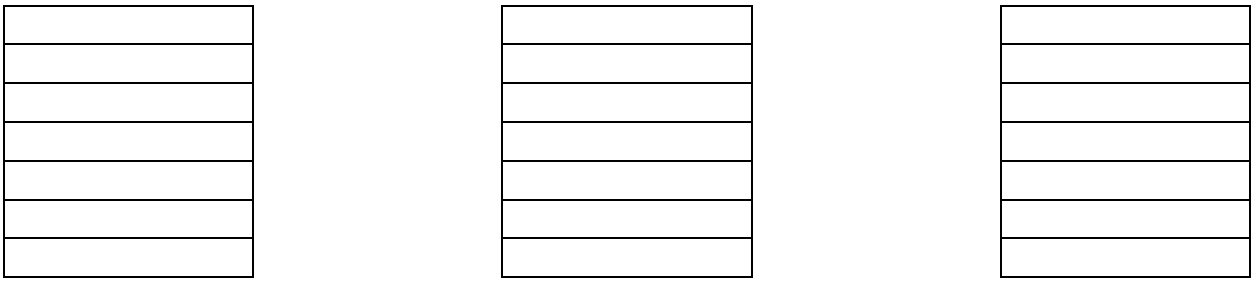
A B C

Value of the Expression: _____

Equivalent Infix Expression: _____

3) (a) (8 pts) Convert the following infix expression to an equivalent postfix expression. Show the state of the operator stack at each of the indicated points:

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



A B C

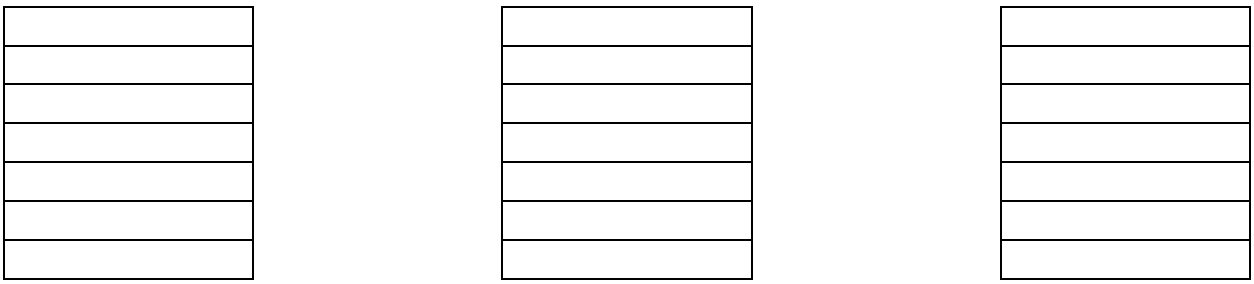
Final Postfix Expression:

_____

(b) (2 pts) What is the value of the postfix expression that is the result of part (a)? _____

4) (a) (8 pts) Convert the following infix expression to an equivalent postfix expression. Show the state of the operator stack at each of the indicated points:

```
          A                                   B                   C
3 + 52 / ( 2 + ( 7 - 12 / ( 9 - 5 ) ) * ( ( 5 + 2 * 3 ) - 15 / ( 1 + 4 ) ) )
```



A B C

Final Postfix Expression:

_____

(b) (2 pts) What is the value of the postfix expression that is the result of part (a)? _____