

Computer Science I – Spring 2012
Lab: Stack Applications – Infix/Postfix (Solutions)

Convert the following INFIX expressions into POSTFIX expressions using stacks (as shown in class). Show the contents of the stack at the indicated points (A,B, and C) in the infix expression.

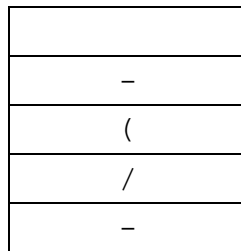
NOTE: There is a SPECIFIC way that these conversion problems are tested. The TA will do problem 1 for you and show you what is expected of you and what you can expect on a test.

You should keep a “WORKING” stack that you use to solve the problem. Then you will copy the contents of this working stack, when appropriate, into the given stacks (stacks A, B, and C).

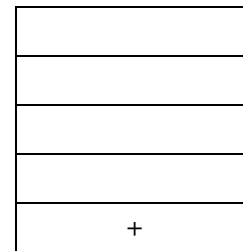
1) **A** **B** **C**
 1) 44 - 15 / (9 - 3 * 2) + 12



A



B

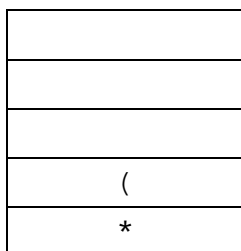


C

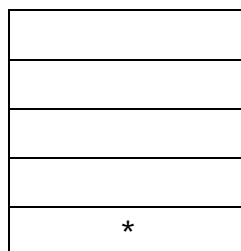
Resulting POSTFIX expression: 44 15 9 3 2 * - / - 12 +

Answer: 51

2) **A** **B** **C**
 2) 12 * (8 - 7 + 1) - (4 + 6) / 2



A



B

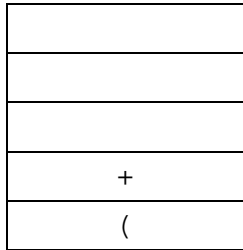


C

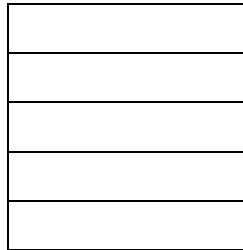
Resulting POSTFIX expression: 12 8 7 - 1 + * 4 6 + 2 / -

Answer: 19

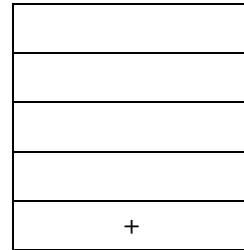
$$3) \quad (3 + 8 + 5 - 10) / 3 + 4 + 5 - 7$$



A



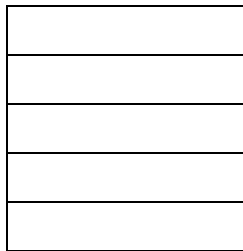
B



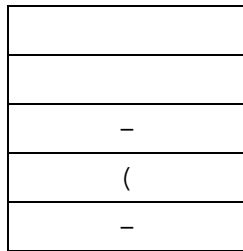
C

Resulting POSTFIX expression: 3 8 + 5 + 10 - 3 / 4 + 5 + 7 -
Answer: 4

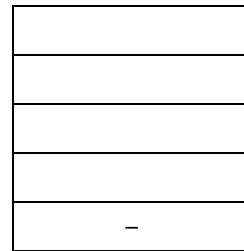
$$4) \quad 14 - (6 - 10) - 10$$



A



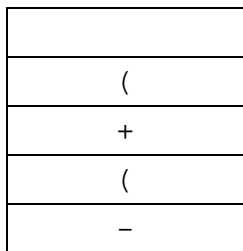
B



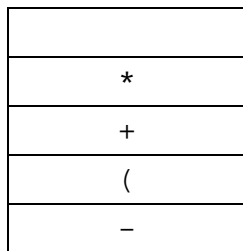
C

Resulting POSTFIX expression: 14 6 10 - - 10 -
Answer: 8

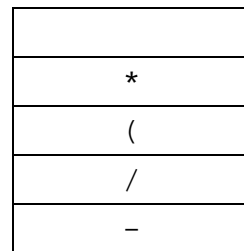
$$5) \quad 16 - (8 + (10 - 7 + 3) * 2 - 10) / ((4 - 2) * 3 - 1)$$



A



B



C

Resulting POSTFIX expression:
 16 8 10 7 - 3 + 2 * + 10 - 4 2 - 3 * 1 - / -

Answer: 14