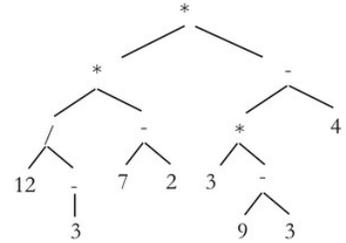


1. What does this AST evaluate to?



2. What does the following expression evaluate to? $((xy. (* x (+ x y))) 4 1)$

3. What does the following expression evaluate to? $((xyz. (* x (* x y))) 4 1 3)$

4. Starting with an empty stack, which **two** sequence of operations will yield the string **LICK** from the incoming string **LIMERICK**. *Note:* It is acceptable for there to still be characters on the stack and/or on the incoming string when your output is complete.

You must select two answers to be correct!

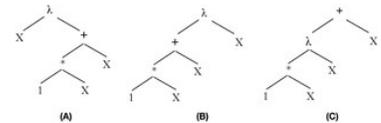
- A OXOXOOOOOXOX
- B OXOOOOOXOXOX
- C OXOXOOXOOXOX
- D OXOXOOXXOXOX
- E OXOOOOOXOXOO

5. Starting with an empty stack, what sequence of operations will yield the string **MIRE** from the incoming string **LIMERICK**. *Note: It is acceptable for there to still be characters on the stack and/or on the incoming string when your output is complete.*

- (A) OOOXXOOXXX
- (B) OOOXXXOOXX
- (C) OOXOXOOXX
- (D) OOOXXOOXX
- (E) OOOXXOOOX

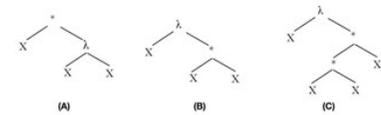
6. Which of the following ASTs is equivalent to $(x + (* 1 x) x)$?

- (A) A
- (B) B
- (C) C



7. Which of the following ASTs could be used to correctly calculate the square of a number?

- (A) A
- (B) B
- (C) C



8. Starting with an empty stack, what is the output after the following operations are performed, given the input string of 123456? *Hint: Anything popped off the stack goes to the output.*

OXOOOXOOXX

- (A) 3452
- (B) 4235
- (C) 1345
- (D) 1234
- (E) 1465

9. Which of the following prefix notation expressions is equivalent to $(2 + X^2 * 4 + 3)$?

- (A) $(* 4 (+ (+ 3 (\text{sqr } X)) 2))$
- (B) $(+ 3 (+ (* 4 (\text{sqr } X))) 2)$
- (C) $(+ 3 (+ (* 4 (\text{sqr } X^2)) 2))$
- (D) $(+ 3 (+ (* 4 (\text{sqr } X)) 2))$
- (E) $(+ 3 (+ (* 4 X^2) 2))$