



American Computer Science League

2019-2020

Contest #2

SENIOR DIVISION

1. Prefix/Infix/Postfix Notation

Convert this prefix expression to postfix:

$$* a + a \uparrow + \uparrow a 2 * 4 \uparrow b 2 / 1 2$$

1.

2. Prefix/Infix/Postfix Notation

Evaluate the following prefix expression if

$$@abc = \frac{1}{2}(a+b+c) \quad \text{and} \quad \#abc = \frac{1}{3}(a*b*c):$$

Note: all numbers are single digits.

$$- \# / + 7 5 2 - 6 * 4 1 \uparrow 4 2 @ - 6 3 + 5 2 \uparrow 2 3$$

2.

3. Bit-String Flicking

Evaluate the following:

$$(LCIRC-2 \ 01101) \text{ OR } (NOT \ 10110) \text{ AND } (RSHIFT-1 \ (RCIRC-2 \ 10110))$$

3.

4. Bit-String Flicking

Solve for X (5 bit string):

$$(LSHIFT -1 \ 10111) \text{ OR } (LCIRC -2 \ (RSHIFT -1 \ X)) \\ \text{AND } (RCIRC -3 \ (NOT \ 01101)) = 01110$$

4.

5. LISP

Evaluate this LISP expression:

$$(CAR \ (CDR \ (CAR \ (REVERSE \ (CDR \ '((a \ (b \ c)) \ c \ d \ (e \ (d \ a \ (c \ b \ (e))))))))))$$

5.

