**ACSL**

**American Computer Science League**

#### Contest #2

**2013 - 2014**

### Senior Division Solutions

# Prefix/Infix/Postfix

#  − + A B \* / \* C ↑ D 2 A B =

 −(A+B)\*/\*C(D2)AB = −(A+B)\*/(C\*D2)AB =

 −(A+B)\*(C\*D2/A)B = −(A+B)(C\*D2/A\*B) =

 A + B – C \* D2 / A \* B = 8 + 4 – 2 \* 62 / 8 \* 4 =

 8 + 4 – 2 \* 36 / 8 \* 4 = 8 + 4 – 36 = 12 – 36 = -24

1. -24

# 2. Prefix/Infix/Postfix

 $\frac{A(B+C)}{A-C}$ + $\frac{A+B}{C^{2}}$ = [A(B+C)]/(A-C) + (A+B)/C2

 = [ABC+\*]/[AC-] + [AB+]/[C2↑]

 = [ABC+\*AC-/] +[AB+C2↑/]

 = A B C + \* A C - / A B + C 2 ↑ / +

1. **Bit-String Flicking**

 (RSHIFT-2 (LCIRC-1 01011)) OR (NOT(LSHIFT-1(RCIRC-3 10110)))

 = (RSHIFT-2 10110) OR (NOT(LSHIFT-1 11010))

 = 00101 OR (NOT10100) = 00101 OR 01011 = 01111

4. \*1111

**4. Bit-String Flicking** (RCIRC-2 (LSHIFT-1 X)) = 10111

 Let X = abcde

 LHS = ((RCIRC-2 (LSHIFT-1 X))

 = ((RCIRC-2 (LSHIFT-1 abcde))

 = (RCIRC-2 bcde0) =e0bcd

 e0bcd = 10111 → e = 1, b = 1, c = 1, d = 1, a = \* → \*1111

3. 01111

1. **LISP**

 ( MULT ( ADD ( SUB 10 2 ) 3 ) ( EXP 2 4 ))

 = ( MULT ( ADD 8 3 ) 16)

 = ( MULT 11 16) = 176

5. 176

2. As shown