

**Classroom Division**

<p><b>1. Prefix/Infix/Postfix</b>            Evaluate the following postfix expression if <math>a = 12</math>, <math>b = 2</math>, <math>c = 3</math>:</p> $a\ b / a\ b\ c\ \uparrow\ * + a\ b\ c\ * a - * a / -$	108
<p><b>2. Prefix/Infix/Postfix</b>            Convert the infix expression to a prefix expression.</p> $\frac{a*(b-c)\uparrow 2}{b} - \frac{c}{a\uparrow 2}$	$- / * a \uparrow - b c 2 b / c \uparrow a 2$
<p><b>3. Bit-String Flicking</b>            Evaluate the following:</p> <p style="text-align: center;"><b>01101 OR (NOT 10111) AND 10010</b></p>	01101
<p><b>4. Bit-String Flicking</b>            Evaluate the following:</p> <p style="text-align: center;"><b>(LCIRC-2 01110) OR ((NOT 10110) AND (RSHIFT-1 01110))</b></p>	11001
<p><b>5. What Does This Program Do?</b></p> <p>What numbers are printed after the following program is executed?</p> <pre> C = 0: S = 0 FOR I = 1 TO 50   IF I/2 = INT(I/2) THEN C = C + 1 ELSE S = S + 1 NEXT I FOR K = 1 TO 50   IF (K/3 = INT(K/3)) AND (K/2 &lt;&gt; INT(K/2))     THEN C = C + 1 ELSE S = S + 1 NEXT K FOR J = 1 TO 50 STEP 2   IF (J/5 = INT(J/5)) AND (J/3 &lt;&gt; INT(J/3))     THEN C = C + 1 ELSE S = S + 1 NEXT J PRINT C, S END           </pre>	36, 89

**ACSL**  
**American Computer Science League**  
**Contest #2**  
**Classroom Division**

2015- 2016

Contest #2

**6. Prefix/Infix/Postfix**

Convert this infix expression (Heron's formula for the area of a triangle) into a prefix expression.

$$(s * (s - a) * (s - b) * (s - c))^{1/2}$$

↑ \* \* \* s - s a - s b - s c / 1 2

**7. Prefix/Infix/Postfix**

Evaluate the following postfix expression:  
 (Note: all numbers are single digits)

$$2\ 3\ 2\ \uparrow\ -\ 4\ 8\ 2\ / \ 1\ +\ * \ 2\ / \ + \ 2\ 3\ * \ 6\ / \ +$$

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**8. Bit-String Flicking**

How many different values of X (a 5-bit string) satisfy the following expression.

$$RCIRC-3\ 10101\ OR\ LCIRC-2\ X = 10111$$

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**9. Bit-String Flicking**

Solve for X (a 5-bit string):

$$(LCIRC-2\ 01110)\ AND\ X = (RSHIFT-1\ 10011)$$

01\*\*1

**10. LISP**

Evaluate the following LISP expression:

$$(MULT\ (ADD\ 2\ 3\ 1\ (EXP\ 3\ 2))\ (SUB\ (MULT\ 4\ 2)\ (DIV\ 10\ 2)))$$

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