

American Computer Science League

2023-2024 • Contest 2: Short Problems • Intermediate Division

1. Prefix/Infix/Postfix Notation Evaluate the following postfix expression if all numbers are single digits: $5\ 8 - 6\ 9\ 6 - * 3 / +$	A. 6 B. 11 C. 3 D. -2 E. 18
2. Prefix/Infix/Postfix Notation Translate the following infix expression into prefix: $\frac{(a+b)^2 - c}{d + e(b^2 - a)}$	A. $/-^{++}ab2cd*e-^{b2}a$ B. $/-^{ab2}c++d*e-^{b2}a$ C. $/^{+}ab2c+d*e-^{b2}a$ D. $/-^{+}ab2c-d*e+^{b2}a$ E. $/-^{+}ab2c+d*e-^{b2}a$
3. Bit-String Flicking Evaluate: $(\text{LCIRC-2 (RSHIFT-1 (NOT 10100))}) \text{ OR } (\text{RCIRC-1 (LSHIFT-2 10111)})$	A. 01011 B. 00101 C. 01111 D. 11110 E. 11111
4. Bit-String Flicking Solve the following expression for X if X is a 5-bit string: $(\text{LCIRC-2 01101}) \text{ AND } X \text{ OR } (\text{RSHIFT-1 01111}) = 10111$	A. $0*1*0$ B. $1****$ C. $0***1$ D. $01*01$ E. 00101
5. LISP Evaluate the following LISP expression: $(\text{CAR (CDR (CAR (CDR '(5 (2 (3 4) 1) (6 7 8) 9))))})$	A. (7 8) B. (6 7 8) C. (3 4) D. ((3 4) 1) E. (2 (3 4))