American Computer Science League

2020-2021 ● Contest 2: Shorts ● Intermediate Division

1. Prefix-Infix-Postfix

Evaluate the following prefix expression if all numbers are single digits:

− / * 4 + 2 3 * 2 5 / + ^ 6 2 4 8

A. 4
B. 3
C. 0
D. -3
E. -4

2. Prefix-Infix-Postfix

The formula for the surface area of a right circular cylinder is:

$A = 2\pi rh + 2\pi r^2$

Convert the entire formula to postfix using P for π.

A. A2Pr**h*2P*r2^*+=
B. A2P*r*h*2P*r2*^+=
C. A2P*r*h*2P*r2^*+=
D. A2P*r*h*2P*r2^+*=
E. A2P*r*h*2Pr2*^*+=

3. Bit-String Flicking

Evaluate the following expression:

((LSHIFT-1 11011) OR (RCIRC-2 01101) AND 01111)

A. 11111
B. 10111
C. 01111
D. 01010
E. 00010

4. Bit-String Flicking

How many bit strings make the following equation TRUE?

((LCIRC-3 X) AND 10110) = 10100

A. 2
B. 3
C. 4
D. 5
E. 8

5. LISP

Evaluate the following LISP expression:

(CDR (CAR '((b c d) (e f) g)))

A. (b)
B. (d)
C. (b c)
D. (c d)
E. (b d)