

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:

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

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:

$((\text{LSHIFT-1 } 11011) \text{ OR } (\text{RCIRC-2 } 01101) \text{ AND } 01111)$

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

4. Bit-String Flicking

How many bit strings make the following equation TRUE?

$((\text{LCIRC-3 } X) \text{ AND } 10110) = 10100$

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

5. LISP

Evaluate the following LISP expression:

$(\text{CDR } (\text{CAR } '((b\ c\ d)\ (e\ f)\ g)))$

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

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<p>1. 前缀-中缀-后缀</p> <p>如果所有数都是一位数字，请计算以下前缀表达式：</p> $- / * 4 + 2 3 * 2 5 / + ^ 6 2 4 8$	<p>A. 4 B. 3 C. 0 D. -3 E. -4</p>
<p>2. 前缀-中缀-后缀</p> <p>直立圆柱体的表面积公式是：</p> $A = 2\pi rh + 2\pi r^2$ <p>用 P 代替 π，把这个公式转换为后缀表达式。</p>	<p>A. $A2Pr**h*2P*r2^{*}+=$ B. $A2P*r*h*2P*r2^{*}+=$ C. $A2P*r*h*2P*r2^{*}+=$ D. $A2P*r*h*2P*r2^{*}+=$ E. $A2P*r*h*2Pr2^{*}+=$</p>
<p>3. 比特位操作</p> <p>计算以下表达式：</p> $((\text{LSHIFT}-1\ 11011) \text{ OR } (\text{RCIRC}-2\ 01101) \text{ AND } 01111)$	<p>A. 11111 B. 10111 C. 01111 D. 01010 E. 00010</p>
<p>4. 比特位操作</p> <p>有多少个比特串能使以下等式为真？</p> $((\text{LCIRC}-3\ X) \text{ AND } 10110) = 10100$	<p>A. 2 B. 3 C. 4 D. 5 E. 8</p>
<p>5. LISP</p> <p>计算以下 LISP 表达式的值：</p> $(\text{CDR } (\text{CAR } '((b\ c\ d)\ (e\ f)\ g)))$	<p>A. (b) B. (d) C. (b c) D. (c d) E. (b d)</p>