

# American Computer Science League

2021-2022 • Contest 2: Shorts • Junior Division

## 1. Prefix/Infix/Postfix

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

$$+ / 9 3 + * 4 - 8 3 ^ 5 2$$

- A. 33
- B. 42
- C. 48
- D. 52
- E. 63

## 2. Prefix/Infix/Postfix

Convert this infix expression to postfix:

$$\frac{(A^2 + B)(B^2 - C)}{B + D^2}$$

- A.  $A^2 B^+ B^2 C^-$   
 $* B D^2^+ /$
- B.  $A^2 B^+ B^2 C^-$   
 $* B D^2^+ /$
- C.  $A^2 B^+ B^2 C^-$   
 $* D B^2^+ /$
- D.  $A^2 B^+ B^2 C^-$   
 $* B D^2^+ /$
- E.  $A^2 B^+ B^2 C^-$   
 $* B D^2^+ /$

## 3. Bit-String Flicking

Evaluate:

$$01100 \text{ OR } 11011 \text{ AND } 01010$$

- A. 11011
- B. 01110
- C. 01010
- D. 10011
- E. 11101

## 4. Bit-String Flicking

Evaluate:

$$(\text{LCIRC-2 } 01100) \text{ AND NOT } 11010 \text{ OR } (\text{RSHIFT-1 } 01100)$$

- A. 11010
- B. 10101
- C. 00111
- D. 10110
- E. 01010

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**5. What Does This Program Do? (Loops)**

What is the final value of x when this program is executed?

```
x = 0
for a = 1 to 10
  for b = 1 to a
    if a % b == 0 then
      x = x + 1
    end if
  next b
next a
output x
```

- A. 8
- B. 10
- C. 17
- D. 27
- E. 55

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