2001	-2002

## **American Computer Science League**

## Contest #1

## **Intermediate Division**

## **Solutions**

1.	BED converts to $1011\ 1110\ 1101_2$ . Regrouping to sets of 3 digits gives $101\ 111\ 101\ 101_2$ . This converts to $5755_8$	1. 5755 <sub>8</sub> or 5755	
2.	The base 8 addition gives $103327_8$ . Converting to base 2 gives $001\ 000\ 011\ 011\ 010\ 111_2$ . Regrouping using sets of 4 digits gives $1000\ 0110\ 1101\ 0111_2$ . This converts to $86D7_{16}$ .	2. 86D7 <sub>16</sub> or 86D7	7
3.	(ADD (SUB 4 5 ) (ADD 6 3) (MULT 4 8 )) simplifies to (ADD -1 9 32) = 40	3. 40	
4.	f(7) = f(5) + 2 = 7 + 2 = 9 $f(5) = f(3) + 2 = 5 + 2 = 7$ $f(3) = f(1) + 2 = 3 + 2 = 5$ $f(1) = 1 + 2 = 3$	4. 9	
5.	f(7,4) = 4 - f(2,6) = 4 - 7 = -3 $f(2,6) = 2 - f(0,5) = 2 - (-5) = 7$ $f(0,5) = 0 - 5 = -5$	53	