

Name _____

CS 1044 Summer II, 2000 Binary Numbers Review

1) Convert the integer 98 into binary.

Number	Remainder
98	-----
49	0
24	1
12	0
6	0
3	0
1	1
0	1

1100010

2) Double check your work by converting the binary number back to an integer.

$$\begin{array}{r} 1 * 2^6 = 64 \\ 1 * 2^5 = 32 \\ 0 * 2^4 = 0 \\ 0 * 2^3 = 0 \\ 0 * 2^2 = 0 \\ 1 * 2^1 = 2 \\ + 0 * 2^0 = 0 \\ \hline 98 \end{array}$$

3) Convert the floating point number 0.1875 into binary.

Carry	Number
-----	.1875
0	.3750
0	.7500
1	.5000
1	.0000

.0011

4) Double check your work by converting it back to a floating point decimal.

$$\begin{array}{r}
 0 * 2^{-1} = 0 \\
 0 * 2^{-2} = 0 \\
 1 * 2^{-3} = .125 \\
 + 1 * 2^{-4} = .0625 \\
 \hline
 .1875
 \end{array}$$

5) What are the results of the following bitwise operations:

- $01100 \& 11001$ **01000**
- $01111 | 00001$ **01111**
- ~ 10101 **01010**
- $10100 \wedge 11001$ **01101**

6) If X is (in binary) 1001, what is the result of the following shift operations:

- $X \gg 2$ **0010**
- $X \ll 3$ **1001000**