**C Course, Fall ‘08  
Supplementary problems :: 1 August 28th 2008**

**What will the following code output?**

**a.**

printf("%d\n", 5%3);  
printf("%d\n", 5%-3);  
printf("%d\n", -5%-3);  
printf("%d\n", -5%3);

**b.**

printf("%d\n", 5/3);  
printf("%d\n", 5/-3);  
printf("%d\n", -5/-3);  
printf("%d\n", -5/3);

**c.**

int x;  
x = - 3 \* 4 % - 5 / 5;  
printf("%d\n", x);

**d.**

int x=2, y, z;  
x \*= 3 + 2; printf("%d\n", x);  
x \*= y = z = 4; printf("%d\n", x);  
x = y == z; printf("%d\n", x);  
x == (y = z); printf("%d\n", x);

**e.**

int x = 3;  
int y = x + x++;  
printf("x = %d, y = %d\n", x, y);

**f.**

int x = 3;  
int y = x + ++x;  
printf("x = %d, y = %d\n", x, y);

**g.**

int x = 3, y;  
 y = x++ + x++;  
 printf(“%d, %d\n”, x, , y);

**h.**

int x = 3, y;  
 y = x++ + ++x;  
 printf(“%d, %d\n”, x, , y);

**i.**

int x = 3, y;  
 y = ++x + ++x;  
 printf(“%d, %d\n”, x, , y);

**Answers**

**a.**

2  
2  
-2  
-2

**b.**

1  
-1  
1  
-1

**c.**

0

Hint:

Order of precedence is:

! ~ ++ -- - Highest (Unary operators)

\* / %

+ -

<< >>

< <= > >=

== !=

&

^

|

&&

||

= += –*=* \*= /= Lowest

Step 1: (- 3) \* 4 % (- 5) / 5;  
Step 1: ((- 3) \* 4) % (- 5) / 5; // all equal operators now, computation from left to right  
Step 3: -12 % (- 5) / 5;  
Step 4: -2 / 5;

**d.**

10  
40 assignment operator works from right to left  
1 since y and z are equal, y==z returns 1  
1 comparison operator, x remains unchanged

**e.**

x = 4, y = 6

Hint:  
 x++ returns 3 and x is incremented only after the statement “y = x + x++;” is executed

**f.**

x = 4, y = 8

Hint:  
 ++x returns 4 and x is incremented before “x + x++;” is computed

**g.**

5, 6 both x++ return 3 and after y is assigned, x is incremented

**h.**

5, 8

Hint:   
 first of all, x is incremented to 4 (because of ++x). This happens before RHS is computed. So now 4+4 gives y = 8

**i.**

5, 10

Hint:   
 first of all, x is incremented to 5 (because of two ++x).