

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

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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 $++x$).