

Name: Solutions

Date: \_\_\_\_\_ Per: \_\_\_\_\_

AP Computer Science, Mr. Ferraro

## Practice Problems for APCS Quiz #4

1. Write a statement that converts "double p = 73.389" into an int.

$\text{int } z = (\text{int}) p$

← Just the RHS would suffice.

2. The operation you performed in #1 is called a(n) cast.

3. Consider the statement "final double METERS\_PER\_YARD = 39.37 / 36;".

(a) METERS\_PER\_YARD is a(n) constant (more specifically, SYMBOLIC CONST.)

(b) The RHS of the statement evaluates to a(n) double because of data type promotion.

(c) Why are such statements used in programming? Give the most important reason.

program maintenance

4. For each, determine whether the *numeric*, or *literal*, *constant* is valid in Java (T or F).

(a) T 25

(b) T 2.50

(c) T -2.50

(d) F 5,023

5. Operators:

(a) List the *arithmetic* operators<sup>1</sup> recognized by Java:  $*$ ,  $/$ ,  $+$ ,  $-$ ,  $\%$

(b) List the *relational* operators recognized by Java:  $==$ ,  $!=$ ,  $<$ ,  $<=$ ,  $>$ ,  $>=$

(c) List the *logical* operators recognized by Java:  $\&\&$ ,  $\|\|$ ,  $!$

<sup>1</sup>Don't forget modulo!

6. List *all* operators — arithmetic, relational, and logical — below, in a vertical fashion, so that the most important operator is at the top and the least important is at the bottom.

\* , / , %

+ , -

== , != , < , <= , > , >=

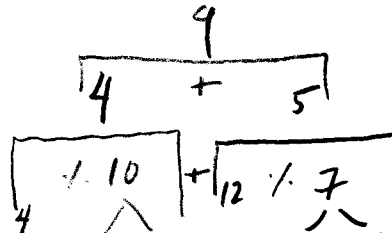
!

&&

||

7. Consider the code below.

```
int a = 12, b = 4;
System.out.println(b % (a - 2) + a % (b + 3));
```



What is printed on the screen?

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8. List as many *primitive data types* from memory as you can. Then, do a quick Web search to fill in the missing data types.

double, float, int, long, short, boolean,  
byte, char

9. Write an expression that sets "k" equal to a random integer between 1 and 8, inclusive.<sup>2</sup>

int k =  $(int)(8 * \text{Math.random}()) + 1$

10. For each given statement, write the value printed to the screen.

(a) System.out.println( "" + 2 + 7 ); 27

(b) System.out.println( 1 + "" + 9 ); 19

(c) System.out.println( -3 + 2 + "" + 5 ); -15

<sup>2</sup>For this problem, use Math.random().

11. For each given expression, rewrite using as few pairs of parentheses as possible without changing the expression's value.

(a)  ~~$5 * a * a - 3 * a + 91 / 10.0$~~   
 $5 * a * a - 3 * a + 91 / 10.0$

(b)  ~~$((2 * p) + q) / (r + h)$~~   
 $(2 * p + q) / (r + h)$

(c)  $!(p \parallel q)$   $\rightarrow$  use DeMorgan's rule.

$!p \&\&!q$

(d)  $!(a \geq 7)$   $\rightarrow$   $!(\leftarrow \frac{\oplus}{7} \rightarrow a) = \leftarrow \frac{\oplus}{7} \rightarrow a$   
 $a < 7$

(e)  $!((k < 7) \&\&(k \geq 1)) = !(k < 7) \parallel !(k \geq 1)$

$k \geq 7 \parallel k < 1$

12. Rewrite the given code snippet using if()-else if()-else.

```
char answer;
String result;

//call method to get user's response
//set 'answer' accordingly...

switch (answer) {
    case 'a':
        result = answer + " is incorrect.";
        break;
    case 'b':
        result = answer + " is incorrect.";
        break;
    case 'c':
        result = answer + " is correct!";
        break;
    case 'd':
        result = answer + " is incorrect.";
        break;
    default:
        result = "INVALID CHOICE.";
        break;
}

System.out.println(result);
```

```
char answer;
String result;
```

```
if (answer == 'a') {
    result = answer + " is incorrect";
} else if (answer == 'b') {
    ...
}
```

do same exact thing for cases {a, b, d}? Better:

```
if (answer == 'a' || answer == 'b' ||
    answer == 'd') {
    result = answer + " is incorrect.";
} else if (answer == 'c') {
    result = "c is correct!";
} else {
    result = "INVALID CHOICE.";
}
System.out.println(result);
```

13. Consider a rewrite of the code from #12, which introduces two bugs. What are they? Be specific!

```
char answer;  
  
//call method to get user's response  
//set 'answer' accordingly...  
  
switch (answer) {  
    case 'a':  
        String result = answer + " is incorrect.";  
        break;  
    case 'b':  
        String result = answer + " is incorrect.";  
        break;  
    case 'c':  
        String result = answer + " is correct!";  
    case 'd':  
        String result = answer + " is incorrect.";  
        break;  
    default:  
        String result = "INVALID CHOICE.";  
        break;  
}  
  
System.out.println(result);
```

①  
Missing  
break,  
so  
result will  
say  
"d is  
incorrect"  
in the  
case  
where  
answer is 'c'.

② Scope issue:

String result exists  
within the scope of  
the SCB block,  
∴ cannot be referenced  
here.