

Consider the following – what is output?

1.

```
System.out.println("hot");
System.out.println("dog");
```

Output

```
hot
dog
```

2.

```
System.out.print("hot\n\t\t");
System.out.println("dog");
```

Output

```
hot
      dog
```

3.

```
System.out.print("hot\t");
System.out.println("dog");
```

Output

```
hot   dog
```

4.

```
System.out.print("hot");
System.out.println("dog");
```

Output

```
hotdog
```

For the following, predict what the output will be, then try running the code in a compiler.

5.

```
int x = 5;
int y = 3;

System.out.print("Answer = " + x + y);
```

Predicted

```
Answer
May Vary
```

Actual

```
Answer = 53
```

6.

```
int x = 5;
int y = 3;

System.out.print("Answer = " + (x + y));
```

Predicted

```
Answer
May Vary
```

Actual

```
Answer = 8
```

Term 1 – Unit 1 – Week 3

### 60-80-100 Quiz: Pounds & Ounces – Solution

There are 16 ounces in a pound. Finish the code below that is intended to let the user input the number of ounces and output the number of pounds and ounces.

So if they enter 37 it should output 2 pounds and 5 ounces.

```
Scanner scan = new Scanner(System.in);
int ounce = scan.nextInt();

//Finish code here:

//Possible Answers:

//1) Using modular division:
System.out.println( ounce/16 + " pounds and " + ounce%16 + " ounces");

//2) Using subtraction division:
System.out.println( ounce/16 + " pounds and " +
    (ounce - (ounce/16)*16) + " ounces");

//3) Using temporary variables
int pound = ounce/16;
ounce = ounce%16; //(or ounce = ounce - 16*pound)
System.out.println(pound + " pounds and " + ounce + " ounces");
```

## Term 1 – Unit 1 – Week 3

## Quiz 1 – Offline Version – Solution

1. What is the most precise primitive data type for storing decimal values?
  - a. char
  - b. int
  - c. double
  - d. String
  - e. None of the above
  
2. What is wrong with the following declaration?

```
char letter = 'cat';
```

  - a. The char data type can only hold one letter at a time.
  - b. The char data type uses " not '.
  - c. The char data type is used for small integer values.
  - d. The char data type cannot hold letters.
  - e. Nothing, the code is fine.
  
3. Which of the following is true about primitive data types?
  - a. There are a total of 2 primitive types.
  - b. They can only hold numeric data.
  - c. They can hold words and numbers.
  - d. Primitives have built in methods.
  - e. They hold only one piece of data at a time.
  
4. What is output by the following code?

```
int x = 9;
System.out.println(x/2);
```

  - a. 4
  - b. 4.5
  - c. 5
  - d. 9
  - e. There is an error – an int cannot be divided by 2.
  
5. If 18 is stored in w, what is stored in w after executing `w += 18`?
  - a. 0
  - b. 18
  - c. 36
  - d. 324
  - e. Nothing, there is an error

## Term 1 – Unit 1 – Week 3

6. Correct the following code:

```
int q = 82.3847;
```

- a. `int q = (double)82.3849;`
- b. `int q = int(82.3847);`
- c. `int q = (int)82.3847;`
- d. `int q = double(82.3847);`
- e. No changes, the code is fine.

7. When you change a variable from one data type to another in Java it is called a \_\_\_\_.

- a. `cast`
- b. translation
- c. calculation
- d. numeric
- e. modular division

8. Consider the following code:

```
int x = -3;  
x--;  
System.out.println(x);
```

What is output?

- a. `-4`
- b. `-2`
- c. `-3`
- d. `2`
- e. `4`

9. Consider the following code:

```
int x = 9;  
int y = 6;  
System.out.println( (x*y)/x );
```

What is output?

- a. `6`
- b. `9`
- c. `54`
- d. `36`
- e. `81`

10. Which of the following would be a legal Java identifier?

- a. `this-value`
- b. `7test`
- c. `int`
- d. `this_value`
- e. `stuff%`

## Term 1 – Unit 1 – Week 4

## Exam 1 – Offline Version – Solution

- Which of the following is a legal variable name in Java?
  - a name
  - num
  - double
  - ans.1
  - 3average
- Which of the following correctly inputs an int?
  - int val = scan.nextValue();
  - int val = scan.nextInt();
  - int val = scan.nextDouble();
  - int val = nextDouble();
  - int val = scan.nextLine();
- Which of the following is true about primitive data types?
  - There are a total of 2 primitive types.
  - They can only hold numeric data.
  - They can hold words and numbers.
  - Primitives have built in methods.
  - They hold only one piece of data at a time.
- To declare an integer variable x and set it equal to 17 you would type:
  - 17 = x;
  - int = 17;
  - int 17 = x;
  - int x = 17;
  - x = 17;
- In Java all output uses the \_\_\_\_ data type
  - int
  - scan
  - String
  - double
  - char
- Which symbol is correct:  
char c = \_ g \_ ;
  - "
  - %
  - +
  - 
  - '

## Term 1 – Unit 1 – Week 4

7. What is roundoff error?
- Errors in converting Strings to numbers.
  - Errors in Division.
  - Errors in modular division.
  - In computers, not every decimal number can be represented exactly in base 2 numbers, so there are sometimes errors with decimal numbers.
  - In computers, not every integer number can be represented exactly in base 2 numbers, so there are sometimes errors with integer numbers.
8. Which of the following needs a cast?
- char stored in an int variable
  - int stored in a char variable
  - char stored in a String variable
  - int stored in a double variable
  - char stored in a double variable
9. What is output?
- ```
System.out.print(23/5);
```
- 0
  - 1
  - 4
  - 4.6
  - 5
10. Correct the following code:
- ```
double q = 82;
```
- int q=(double)82.3847;
  - int q = int(82.3847);
  - int q = (int) 82.3847;
  - int q = double(82.3847);
  - No changes, the code is fine.
11. Which of the following is modular division NOT used for?
- Money calculations
  - Patterns
  - Determining even and odd numbers
  - Converting ints to doubles
  - Time calculations

## Term 1 – Unit 1 – Week 4

12. Which of the following will print the ones column of an integer stored in x?

- a. `System.out.print(10%x);`
- b. `System.out.print(x%1);`
- c. `System.out.print(x%10);`
- d. `System.out.print(x/10);`
- e. None of the above

13. What is  $(16 \% 7) * 2$  ?

- a. 1
- b. 4
- c. 4.5
- d. 6
- e. 8

14. What is output:

```
int x = 10;
System.out.println( "Answer: " + x + 5 );
```

- a. Answer: 15
- b. Answer: x10
- c. Answer: x5
- d. Answer: 105
- e. None of the above

15. The following code is intended to input three integers and print the average. What is a potential problem with the code as written?

```
System.out.println( "Please enter three integers: " );
int a = scan.nextInt();
int b = scan.nextInt();
int c = scan.nextInt();

System.out.println( "The average is: " + (a + b + c)/3 );
```

- a. It needs a cast so that the decimal portion will be shown.
- b. No correction needed, the code will work as written.
- c. It should be divided by 2, not 3.
- d. It should use `scan.nextDouble` instead of `scan.nextInt`.
- e. The parenthesis are not needed and will cause a mathematical error.

16. Which of the following correctly give random numbers between -10 and 10 inclusive?

- a. `int n = (int)(Math.random() * 20)-10;`
- b. `int n = (int)(Math.random() * 21)-10;`
- c. `int n = (int)(Math.random() * 11)-20;`
- d. `int n = (int)(Math.random() * 10)-20;`
- e. `int n = (int)(Math.random() * 10)-21;`

## Term 1 – Unit 1 – Week 4

17. What is output?

```
System.out.println("The answer is: " + Math.pow( 2, 3));
```

- a. The answer is: 1
- b. The answer is: 6
- c. The answer is: 6.0
- d. The answer is: 8
- e. The answer is: 8.0

18. To output:

```
Hi There
```

You would need to use:

```
System.out._____("Hi ");  
System.out.print("There");
```

What would correctly replace \_\_\_\_ ?

- a. output
- b. println
- c. inpout
- d. print
- e. \n

19. Consider the following code:

```
int x = 5;  
int y = 8;  
System.out.println(x + y);
```

What is output:

- a. 1
- b. 13
- c. 58
- d. 85
- e. 5 8

20. Roundoff error occurs because:

- a. Computer input is limited and cannot handle large values.
- b. Storing all numeric values in binary is not exact.
- c. Storing integer values in binary is not exact.
- d. Integer calculations are not exact.
- e. Storing decimal values in binary is not exact.



Term 1 – Unit 1 – Week 4  
Exam Review 1 – Solution

1. Define Primitive Data Type. List 4 primitive data types in Java.

A built-in data type that holds only 1 value at a time.

Examples include int, double, boolean, and char.

2. Which takes up more memory, an int or a double?

A double takes up twice as much memory as an int.

3. Correct the following. Check no correction if the code is correct.

- a. ~~int val = 7.5;~~  No Correction `int val = (int)7.5;`  
 b. `double score = 89;`  No Correction `( or val = 7; )`  
 c. ~~double avg = test1 + test2 / 2;~~  No Correction `double avg = (double)(test1 + test2) / 2;`  
 ( or `1.0 * (test1 + test2) / 2;` )

4. What is output?

```
System.out.println("Answer = " + 67 + 3);
```

Answer = 673

5. What characters do each of the following represent?

`\n` New Line      `\t` Tab      `\\` Back Slash

6. What is modular division? When is it used?

Modular division gives the remainder in division. It is used in patterns and for time and money conversions.

7. You have two integer variables, minutes and hours. Minutes moves up by one. Which of the following will correctly update hour and minutes?

- a. `minutes = minutes % 60;`  
 b. `minutes = minutes + hours % 60;`  
 c. `hours = hours + minutes / 60;`  
`minutes = minutes % 60;`  
 d. `hours = hours + minutes % 60;`  
`minutes = minutes / 60;`  
 e. `hours = hours + minutes / 60;`

8. Evaluate the following expressions:

$$6 \% 6 = \underline{0}$$

$$8 \% 6 = \underline{2}$$

$$4 \% 7 = \underline{4}$$

$$6 \% 3 = \underline{0}$$

$$9 \% 7 = \underline{2}$$

9. What is roundoff error?

Roundoff error is the error that occurs in double calculations because computers cannot represent decimal values exactly. These errors can be avoided by converting double values to ints.

10. Correct the following code so that it does not trigger roundoff error:

```
double val = scan.nextDouble();
System.out.println( 1.0*Math.round( 1000*(val - 13.89) )/1000);
```

\*Students can run this using 67.897 to see roundoff error in action.

# edhesive

## Term 1 – Unit 2 – Week 5

### Worksheet: If Else – Solution

1. Evaluate the following:

a.

```
int x = -6;
int y = 3;
if (x > y)                false          
```

b.

```
int x = -8;
int y = -8;
if (x <= -y)              true          
```

c.

```
int x = 6;
int y = 3;
if (x == y)               false          
```

2. Consider the following:

```
double test = /* Missing Code */;
if (test >= 76.5)
    System.out.println("C");
if (test >= 84.5)
    System.out.println("B");
if (test >= 95.5)
    System.out.println("A");
System.out.println("Well Done");
```

What is output for the following three values of test?

a.

```
test = 76.8;      C
                  Well Done
```

b.

```
test = 83;       C
                  Well Done
```

c.

```
test = 89;       C
                  B
                  Well Done
```

How could the code be changed so that only one value is output?

Add else-if statements to print only one case and include { } brackets around the last if statement.

1. Evaluate the following truth table:

A	B	!A	A    !B	A && (B    !A)
T	T	F	T	T
T	F	F	T	F
F	T	T	F	F
F	F	T	T	F

2. Simplify the expression:

a.

`!(A && B)`

`!A || !B`

b.

`!(A || !B)`

`!A && B`

c.

`!(B || (A && !B))`

`!B && (!A || B)`

3. Write a Java boolean expression for each of the following:

a. If x is equal to 56.

`if (x == 56)`

b. If letter is equal to G. (letter is a char)

`if (letter == 'G')`

# edhesive

Term 1 – Unit 2 – Week 6

## 60-80-100 Quiz: Ifs – Solution

Test the variable, value. If it is between 23 and 78 inclusive, print "yes". Use only one if statement for this quiz.

```
int value;

/* Missing code that sets value */

//Finish code here:

//Answer:

if( value >= 23 && value <= 78 )
    System.out.println("Yes");
```

- Be sure that the && operator is used.
- Since it is inclusive, >= and <= should be used. Alternatively, > 22 and < 79 would also work.
- The variable, value, should be included in both comparisons. Forgetting to include it on the second comparison is a common mistake.
- Students may also include a set of { } brackets around the print statement.

1. Which is used to make decisions in programs?
  - a. the Scanner class
  - b. if statements
  - c. modular division
  - d. while loops
  - e. numeric casts
  
2. Which if statement below tests if letter holds J. (letter is a char)
  - a. if (letter == 'J')
  - b. if (letter == J)
  - c. if (letter >= 'J')
  - d. if( letter = 'J')
  - e. if( letter == "J")
  
3. What does the following code do?

```
if (month == 4)
    if (day > 21)
        System.out.println( "Taurus" );
```

  - a. Tests if month is 4 or day is less than or equal to 21.
  - b. Tests if month is 4 or day is greater than or equal to 21.
  - c. Tests if month is 4 and day is less than or equal to 21.
  - d. Tests if month is 4 and day is greater than 21.
  - e. Error – you cannot have two if statements together.
  
4. What is output to the screen by the following code?

```
int x = 56;
int y = 7;
if (x != y)
    System.out.print("one");
else if (x > y)
    System.out.print("two");
else if (x < y)
    System.out.print("three");
else if (y >= x)
    System.out.print("four");
else
    System.out.print("five");
```

  - a. one
  - b. two
  - c. three
  - d. four
  - e. five

## Term 1 – Unit 2 – Week 6

5. What is output to the screen by the following code?

```
int x = 29%5;
if (x > 10)
    System.out.println( 1);
else if (x > 8)
    System.out.println( 2);
else if (x > 6)
    System.out.println( 3);
else if (x > 4)
    System.out.println( 4);
else
    System.out.println( 5);
```

- a. 1   b. 2   c. 3   d. 4   e. 5

6. The following truth table matches which boolean condition?

A	B	?
T	T	T
T	F	T
F	T	T
F	F	F

- a.  $A \ \&\& \ (A \ || \ B)$   
 b.  $A \ || \ (!A \ \&\& \ !B)$   
 c.  $A \ \&\& \ (A \ \&\& \ B)$   
 d.  $!A \ \&\& \ (A \ || \ !B)$   
 e.  $A \ || \ (A \ || \ B)$

7. Which of the following is true?

```
int a = 5;
int b = 7;
```

- a.  $a < b \ \&\& \ a == b$   
 b.  $a > b \ || \ a != b$   
 c.  $a < b \ \&\& \ a == b$   
 d.  $b >= a \ \&\& \ a >= b$   
 e. None of the above

8. What does short circuit evaluation mean in the following code?

```
if (a < b || c != d)
```

- a. If  $a < b$  is true it doesn't evaluate  $c != d$   
 b. If  $a < b$  is false it doesn't evaluate  $c != d$   
 c. If  $c != d$  is false it evaluates  $a < b$   
 d. If  $c != d$  is true it doesn't evaluate  $a < b$   
 e. If  $a < b$  is true it evaluates  $c != d$

## Term 1 – Unit 2 – Week 6

9. Consider the following expression. Assume that x and y are boolean variables and have been properly initialized.

`(x && y) && !(x || y)`

The result of evaluating the expression above is best described as:

- a. always true
  - b. always false
  - c. true only when x is true and y is true
  - d. true only when x and y have the same value
  - e. true only when x and y have different values
10. Which of the following correctly tests if y is between 5.2 and 21.7 inclusive?
- a. `if (y >= 5.2 && <= 21.7)`
  - b. `if (y > 5.2 && y < 21.7)`
  - c. `if (y >= 5.2 && y <= 21.7)`
  - d. `if (y >= 5.2 || y <= 21.7)`
  - e. None of the above

Trace the output of the following while loops.

1.

```
int i = 2;

while ( i < 10 ) {
    System.out.println( i );
    i += i;
}
System.out.println( i );
```

Output

2  
4  
8  
16

2.

```
int i = 2;

while ( i < 10 ) {
    i += 3;
    System.out.println( i );
    i += 3;
}
```

Output

5  
11

3.

```
int i = 2;

while ( i < 8 ) {
    int a = 10;
    System.out.println( i % 5 );
    i++;
}
```

Output

2  
3  
4  
0  
1  
2



## Term 1 – Unit 3 – Week 8

## Exam 2 – Offline Version – Solution

1. Which statement below tests if letter holds W. (letter is a char variable)

- a. `if ( letter == "W" )`
- b. `if ( letter >= "W" )`
- c. `if ( letter == W )`
- d. `if ( letter = 'W' )`
- e. `if ( letter == 'W' )`

2. What are if statements used for in programs?

- a. Repeating commands
- b. Storing data
- c. Numeric calculations
- d. Numeric casts
- e. Making decisions

3. What is output?

```
int x = 31 % 8;
if ( x > 10)
    System.out.println(1);
else if ( x > 8 )
    System.out.println(2);
else if ( x > 6 )
    System.out.println(3);
else if ( x > 4 )
    System.out.println(4);
else
    System.out.println(5);
```

- a. 1   b. 2   c. 3   d. 4   e. 5

4. Short circuit evaluation means that in the code:

```
if ( y != 0 && x/y > 10 )
```

- a. If  $x/y > 10$  is false it evaluates  $y \neq 0$
- b. If  $y \neq 0$  is false it doesn't evaluate  $x/y > 10$
- c. If  $x/y > 10$  is false it doesn't evaluate  $y \neq 0$
- d. If  $y \neq 0$  is true it doesn't evaluate  $x/y > 10$
- e. If  $y \neq 0$  is false it evaluates  $x/y > 10$

5. The following truth table matches which boolean condition?

A	B	?
T	T	T
T	F	F
F	T	F
F	F	F

f.

- a. `A && ( A || B )`
- b. `A || ( !A && !B )`
- c. `A && ( A && B )`
- d. `!A && ( A || !B )`
- e. `A || ( A || B )`

## Term 1 – Unit 3 – Week 8

6. Consider the following code segment:

```
if( x < 200 || x > 299 )
    System.out.println("Not in the 200's");
else
    System.out.println("In the 200's");
```

Which of the following code segments produces the exact same output?

I.

```
if ( x < 200 )
    System.out.println("Not in the 200's");
else if ( x > 299 )
    System.out.println("Not in the 200's");
else
    System.out.println("In the 200's");
```

II.

```
if ( x < 200) {
    if ( x > 300)
        System.out.println("In the 200's");
    else
        System.out.println("Not in the 200's");
} else
    System.out.println("Not in the 200's");
```

III.

```
if( x >= 200 )
    System.out.println("In the 200's");
else if ( x <= 299 )
    System.out.println("In the 200's");
else
    System.out.println("Not in the 200's");
```

- a. I only
- b. II only
- c. III only
- d. I and II
- e. II and III

7. To test if a grade is not a C (not between 70 and 79 inclusive) you would do:

```
if ( g _____ 70 _____ g _____ 79 )
```

- a. >=, &&, <=
- b. >=, ||, <=
- c. >, ||, <
- d. <, &&, >
- e. <, ||, >

## Term 1 – Unit 3 – Week 8

8. Assume that x and y are properly initialized boolean values. Which option best describes the result?

```
(x || y) && ! (x || y)
```

- a. Always true
- b. Always false
- c. true only when x is true and y is true
- d. true only when x and y have the same value
- e. true only when x and y have different values

9. Assume that x and y are properly initialized boolean variables. Which option best describes the result?

```
!(x && y) || (x && y)
```

- a. Always true
- b. Always false
- c. true only when x is true and y is true
- d. true only when x and y have the same value
- e. true only when x and y have different values

10.  $!(x \geq y \parallel w == z)$  Simplifies to:

- a.  $x \leq y \&\& w == z$
- b.  $x \geq y \parallel w != z$
- c.  $x \leq y \parallel w != z$
- d.  $x \leq y \&\& w != z$
- e.  $x < y \&\& w != z$

11. What is output to the screen by the following code?

```
int c = 0;
while( c < 6) {
    c++;
    System.out.print((int)Math.pow(-1, c) + " ");
}
```

- a. -11-11-11-1
- b. 1-11-11-1
- c. -11-11-11
- d. 111111
- e. -1-1-1-1-1-1

12. How many times will the following loop repeat?

```
int num = 49;
while(num > 0) {
    if( num%9 == 0 )
        num = num + 3;
    else
        num -= 4;
}
```

- a. 20
- b. 21
- c. 22
- d. 23
- e. Infinite loop

## Term 1 – Unit 3 – Week 8

13. What is output to the screen by the following code?

```
int num = 1987;
while( num > 0 ) {
    System.out.print(num%10 + " ");
    num = num/10;
}
```

- a. 8 9 1 0
- b. 198 19 1 0
- c. 19 1 0 0
- d. 7 8 9 1
- e. The loop will not terminate

14. What is output to the screen by the following code?

```
int f = 0;
while( f < 8 ) {
    f++;
    System.out.print( f%3 + " " );
}
```

- a. 2 0 1 2 0 1 2
- b. 0 1 2 0 1 2
- c. 1 2 0 1 2 0 1 2
- d. 1 2 0 1 2 0 1 2 0
- e. 2 0 1 2 0 1 2 0

15. What is output to the screen by the following code?

```
System.out.println("The answer is: " + 5 + 19);
```

- a. The answer is: 519
- b. The answer is: 19
- c. The answer is: 24
- d. The answer is: 5 19
- e. Error – Strings cannot do calculations.

16. What is output to the screen by the following code?

```
System.out.println( Math.sqrt(26) );
```

- a. 5
- b. 5.0
- c. 5.09901951359278
- d. 6
- e. Error – Possible loss of precision

## Term 1 – Unit 3 – Week 8

17. Does the following code need a cast?    If so, what should you type to cast?                   

```
double val = 13;
```

- a. no, none
- b. yes, (decimal)
- c. yes, (double)
- d. yes, (int)
- yes, (String)

18. What are the first and last numbers output by the following code?

```
int count = 4;
while ( count <= 3 ) {
    count++;
    System.out.println(count + " ");
}
}
```

- a. 4      7
- b. 4      8
- c. 5      7
- d. 5      8
- e. Nothing is output.

19. Of the following if statements, which correctly execute exactly two commands when the condition is true and does nothing if it is false?

I.

```
if (y == 99)
    System.out.println("A");
    System.out.println("B");
```

II.

```
if(y == 99)
    System.out.println("A");
    System.out.println("B");
System.out.println("C");
```

III.

```
if(y == 99) {
    System.out.println("A");
    System.out.println("B");
}
```

- a. I only
- b. II only
- c. III only
- d. II and III but not I
- e. I and III but not II

## Term 1 – Unit 3 – Week 8

20. Consider the following code segment:

```
int c = 1;
while(c <= 35) {
    c++;
    if(c%5 == 0)
        System.out.print(c + " ");
}
```

Which of the following produces the exact same output?

I.

```
int c = 1;
while(c <= 35) {
    c++;
    if( c%5 == 4)
        System.out.print( (c + 1) + " ");
}
```

II.

```
int c = 0;
while(c <= 35) {
    c += 5;
    System.out.print(c + " ");
}
```

III.

```
int c = 0;
while(c < 35) {
    c += 5;
    System.out.print(c + " ");
}
```

- a. I only
- b. II only
- c. III only
- d. I and III only
- e. I, II and III

Term 1 – Unit 3 – Week 8  
Exam Review 2 – Solution

1. What are if statements used for?

To allow programs to make true/false decisions

2. Write the symbol for each of the following boolean operations:

And && Not ! Or ||

3. Why are {} sometimes necessary with if's and loops?

They group commands that an if statement or loop will execute.  
They allow for more than one line of code in an if statement or loop.

4. What is output?

```
int x = 1;
if( x == 3 )
    System.out.println("C");
    System.out.println("A");
System.out.println("T");
```

Output
A
T

5. What is else used for?

Else is used to carry out commands when an if statement is false.

6. What is wrong with the following? (There may be more than one problem)

```
if( a = b ) {
    System.out.print("A");
    System.out.print("B");
Else
    System.out.print("C");
}
```

The "Else" should be changed to "else".  
The "]" is in the wrong place.  
The condition should be "a == b" instead of "a = b".

A	B	!B	(A && !B)	!(A    B)	(A && !B)	!((A && !B)    !(A    B))
T	T	F	F	F	F	T
T	F	T	T	F	T	F
F	T	F	F	F	F	T
F	F	T	F	T	T	F

7. Simplify !((A && !B) || !(A || B)) B

8. Complete the truth tables:

A	B	!A    B
T	T	T
T	F	F
F	T	T
F	F	T

A	B	!(A && B)    !A
T	T	F
T	F	T
F	T	T
F	F	T

9. What is short circuit evaluation? Give an example

where this might be useful.

Short circuit evaluation tests the left hand side of a boolean operation, skipping the right hand side if it is not needed to evaluate the expression. Ex: if ( denominator != 0 && numerator/denominator > .5)

10. What are loops used for?

Loops are used to repeat commands.

11. Write a loop that will run until the user enters a negative number. (Assume there is a Scanner, scan)

```
While( num >= 0) { // (brackets are not required for one line loops)
    num = scan.nextInt(); }
```

## Term 1 – Unit 3 – Week 9

## Worksheet: String Functions – Solution

Consider the following – what is output?

```
String w1 = "The Adventure of the Tall Man";
String w2 = "The Hound of the Baskervilles";
```

1. `System.out.println(w1.length());` // 29
2. `System.out.println(w2.substring(4));` // Hound of the Baskervilles
3. `System.out.println(w1.substring(w1.length()-4));` // Man
4. `System.out.println(w1.indexOf('d'));` // 5
5. `System.out.println(w2.indexOf('d'));` // 8
6. `System.out.println(w1.compareTo(w2));` // -7
7. `System.out.println(w2.charAt(w2.length()-1));` // s
8. `System.out.println(w2.charAt(4));` // H
9. `System.out.println(w1.charAt(w2.indexOf('B')));` // t
10. `System.out.println(w2.substring(w1.indexOf('d')));` // ound of the Baskervilles
11. `System.out.println(w2.substring(17).toUpperCase());` // BASKERVILLES



## Term 1 – Unit 3 – Week 9

## Worksheet: Basic Arrays

## 1. True or false?

- |   |   |   |
|---|---|---|
| An array is an example of a primitive data type, and not a class. | T | F |
| All elements of an array must be of the same data type.           | T | F |
| The elements of an array must be a primitive data type.           | T | F |
| To access the first element of an array, a, you would use a[1].   | T | F |

For questions 2-4, assume that the following array has been declared:

```
int a [] = {95, 72, 78, 27, 15, 37, 21, 55, 43, 17};
```

Then write the output of each piece of code in the corresponding blanks

## 2.

```
System.out.println(a.length);
```

\_\_\_\_\_

## 3.

```
for (int i = 0; i < a.length; i++) {
    if (a[i] % 10 < 5)
        System.out.print(a[i] + " ");
}
```

\_\_\_\_\_

## 4.

```
for (int i = 1; i < a.length; i += 2) {
    System.out.print(a[i] + " ");
}
```

\_\_\_\_\_

## 5. Why do we use for loops with Arrays?

## 6. What are reference variables? Be sure to include the null command.

## 7. To process an array of 16 elements, you use the following loop header:

```
for (int k = 1; k < 16; k++)
```

Why do you use < instead of <=?

## Term 1 – Unit 3 – Week 9

## Worksheet: Basic Arrays – Solution

## 1. True or false?

- |   |   |   |
|---|---|---|
| An array is an example of a primitive data type, and not a class. | T | F |
| All elements of an array must be of the same data type.           | T | F |
| The elements of an array must be a primitive data type.           | T | F |
| To access the first element of an array, a, you would use a[1].   | T | F |

For questions 2-4, assume that the following array has been declared:

```
int a [] = {95, 72, 78, 27, 15, 37, 21, 55, 43, 17};
```

Then write the output of each piece of code in the corresponding blanks

## 2.

```
System.out.println(a.length);
```

10

## 3.

```
for (int i = 0; i < a.length; i++) {
    if (a[i] % 10 < 5)
        System.out.print(a[i] + " ");
}
```

72 21 43

## 4.

```
for (int i = 1; i < a.length; i += 2) {
    System.out.print(a[i] + " ");
}
```

72 27 37 55 17

## 5. Why do we use for loops with Arrays?

Since for loops have the counting variable built in they help us quickly access all the elements in an array.

## 6. What are reference variables? Be sure to include the null command.

Class types store a reference to the spot in memory where the data for the object is stored. Variables that represent class types are reference variables, because they store a reference to the data. When an object is not assigned a memory address it stores the *null* keyword.

## 7. To process an array of 16 elements, you use the following loop header:

```
for (int k = 1; k < 16; k++)
```

Why do you use < instead of <=?

Because array indexing starts at 0, the last element of the array is always length - 1 (15 in this case). If you used <= you would go out of bounds of the array when k is equal to 16.

Term 1 – Unit 3 – Week 9

### 60-80-100 Quiz: Iguana – Solution

Declare a String and store the word, iguana. Using one line for each, print the String's length, first character and last character. Use String methods, so that the printing would work the same for any non-empty String.

```
//Write your program here:  
  
//Solution:  
  
//Declare the String.  
String word = "Iguana";  
  
//Print the length, first char, and last char.  
System.out.println( word.length( ) );  
System.out.println( word.charAt(0) );  
System.out.println( word.charAt( word.length() - 1 ) );
```

- The string variable does not need to be named word.

Term 1 – Unit 3 – Week 10

### 60-80-100 Quiz: Array Sum – Solution

Assume the following code:

```
int a [] = new int [20];  
//Missing code to initialize the array
```

Write the code to find the sum of elements in the array.

```
//Finish the program here:
```

```
//Solution:  
int sum = 0;  
for(int i = 0; i < a.length; i++)  
{  
    sum += a[i];  
}
```

- Make sure that students declare "int sum = 0;"
- Also watch out for added parenthesis on "a.length;"

## Term 1 – Unit 3 – Week 10

## Quiz 3 – Offline Version – Solution

1. Assume you have the following array:

```
int[] a = {1,2,3,4,5};
```

How would you increment the fourth element in the array by one?

- a. 3++;
  - b. 4++;
  - c. a[2]++;
  - d. a[3]++;
  - e. a[4]++;
2. What does the String method indexOf() do?
- a. Returns the location of a certain character in the String object.
  - b. Tests two String objects for equality.
  - c. Compares this String with a secondString for greater than, equal to or less than
  - d. Returns the character at a certain location.
  - e. Returns the length of a String.

3. Consider the following code:

```
String str = "Computer Science";
```

Which of the following statements correctly prints the last character in the String str?

- a. System.out.println(str.charAt(0));
  - b. System.out.println(str.charAt(1));
  - c. System.out.println(str.charAt(str.length()));
  - d. System.out.println(str.charAt(str.length() - 1));
  - e. System.out.println(str.charAt(str.length() + 1));
4. Consider the following Strings:
- ```
s1 = "PH";  
s2 = "ph";  
s3 = "Patrick Henry";
```
- Given that P comes before p in dictionary order, which of the following is true?
- a. s1.compareTo(s2) < 0 && s2.compareTo(s3) < 0
  - b. s2.compareTo(s1) < 0 || s3.compareTo(s1) < 0
  - c. s3.compareTo(s1) < 0 && s1.compareTo(s2) < 0
  - d. !(s1.equals(s2) && s3.compareTo(s2) < 0)
  - e. s1.compareTo(s2) <= 0 && s2.compareTo(s3) < 0

5. The index of the last element of an array is \_\_\_\_.

- a. .size
- b. .length
- c. .length - 1
- d. .size - 1
- e. .length()

## Term 1 – Unit 3 – Week 10

6. Consider the following code:

```
if (s.toLowerCase().equals(s.toUpperCase()))
    System.out.println("*");
```

What does the code do?

- Tests if the String s contains only non-letter characters.
  - Tests if the String s contains Only upper-case letters.
  - Tests if the String s contains only digits.
  - Tests if the String s contains Only lower-case letters.
  - None of the above
7. Which of the following can be stored in a standard array?
- ints
  - Strings
  - boolean
  - doubles
  - All of the above
8. Which of the following would be a for loop be best for?
- Input names until the user enters "Stop".
  - Input 34 test scores.
  - Input words until the total length of the words is greater than or equal to 1000.
  - Input numbers until the user types in -1.
  - Input numbers and calculate the sum. Repeat until the sum is greater than 100.
9. Fill in the blanks on the following for loop header so that the code prints the numbers: 2 4 6 8.

```
for (int i = ____; i ____; i ____)
    System.out.print(i + " ");
}
```

- 2, < 10, += 2
  - 0, < 10, += 2
  - 2, <= 10, ++
  - 2, <= 10, += 2
  - 0, <= 10, += 2
10. Fill in the blanks on the following for loop header so that the code prints the numbers: 9 8 7 6 5 4 3 2 1.

```
for (int i = ____; i ____; i ____) {
    System.out.print(i + " ");
}
```

- 10, > 1; ++
- 10, >= 1; --
- 10, >= 1; ++
- 10, > 1; --
- 9, >= 1; --