

# Solutions to Quick Check Questions

## 3

### Numerical Data

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#### 3.1 Variables

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1. Why are the following declarations all invalid?

```
1 —> int      a, b, a;  
2 —> float    x, int;  
3 —> float    w, int x;  
4 —> bigNumber double;
```

1. The variable **a** is declared twice.
2. Reserved word `int` cannot be used as an identifier.
3. Need a semicolon after `w` instead of a comma or remove the reserved word `int`.
4. The order of data type and identifier is reversed.

2. Assuming the following declarations are executed in sequence, why are the second and third declarations invalid?

```
int      a, b;  
int      a, b;  
int      a, b;
```

```
int    a;
float  b;
```

*Because you are not allowed to declared the same identifier more than once.*

3. Name six data types for numerical values.

byte, short, int, long, float, double

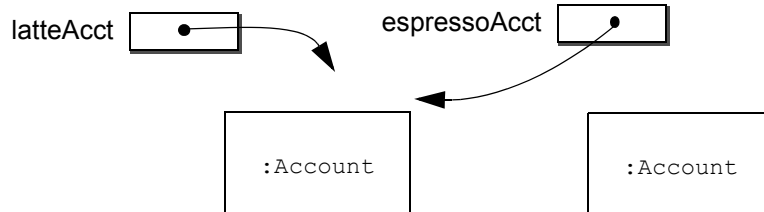
4. Which of the following are valid assignment statements (assuming the variables are properly declared)?

```
Valid → x    = 12;
        12   = x; ← Invalid
        y + y = x; ← Invalid
Valid → y    = x + 12;
```

5. Draw the state-of-memory diagram for the following code:

```
Account latteAcct, espressoAcct;

latteAcct = new Account();
espressoAcct = new Account();
latteAcct = espressoAcct;
```



### 3.2 Arithmetic Expressions

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1. Evaluate the following expressions:

- $3 + 5 / 7$
- $3 * 3 + 3 \% 2$
- $3 + 2 / 5 + -2 * 4$
- $2 * (1 + -(3/4) / 2) * (2 - 6 \% 3)$


- a. 3
- b. 10
- c. -5
- d. 4

2. What is the data type of the result of the following expressions?

- a.  $(3 + 5) / 7$
- b.  $(3 + 5) / (\text{float}) 7$
- c.  $(\text{float}) ((3 + 5) / 7)$

- a. *int*
- b. *float*
- c. *float*

3. Which of the following expressions is equivalent to  $\frac{-b(c+34)}{2a}$  ?

- this 
  - a.  $-b * (c + 34) / 2 * a$
  - b.  $-b * (c + 34) / (2 * a)$
  - c.  $-b * c + 34 / (2 * a)$

**b**

### 3.3 Constants

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No Quick Check Questions.

### 3.4 Getting Numerical Input Values

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1. Write a code fragment to input the user's height in inches and assign the value to an int variable named height.

```
String str
    = JOptionPane.showInputDialog(null,
        "Enter height (inches):");
```

```
int height = Integer.parseInt(str);
```

- Write a code fragment to input the user's weight in pounds and display the weight in kilograms. 1 lb = 453.592 grams.

```
String str
    = JOptionPane.showInputDialog(null,
        "Enter weight (lbs):");

int weight = Integer.parseInt(str);

JOptionPane.showMessageDialog(null,
    "Entered weight in kilograms = " +
    weight * .453592);
```

### 3.5 Standard Output

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- Using the standard output, write a Java statement to display a message dialog with the text I Love Java.

```
System.out.print("I Love Java");
```

- Using the standard output, write statements to display the following shopping list:

```
Shopping List:
    Apple
    Banana
    Lowfat Milk
```

```
System.out.println("Shopping List:");
System.out.println("    Apple");
System.out.println("    Banana");
System.out.println("    Lowfat Milk");
```

*It can be done in one statement also as*

```
System.out.println("Shopping List:\n" +
    "    Apple\n" +
    "    Banana\n" +
    "    Lowfat Milk");
```

### 3.6 Standard Input

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1. Using the standard input, write a code fragment to input the user's height in inches and assign the value to an int variable named height.

*We assume the buffered reader is already defined and created properly.*

```
String inputStr;
int height;

System.out.print("Enter height (inches): ");

inputStr = bufReader.readLine();

height = Integer.parseInt(inputStr);
```

2. Using the standard input and output, write a code fragment to input the user's weight in pounds and display the weight in kilograms. 1 lb = 453.592 grams.

*We assume the buffered reader is already defined and created properly.*

```
String inputStr;
int weight;

System.out.print("Enter weight (lbs): ");

inputStr = bufReader.readLine();

weight = Integer.parseInt(inputStr);

System.out.println("Entered weight in grams = " +
    weight * 453.592);
```

### 3.7 The Math Class

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1. What's wrong with the following?

a. `y = (1/2) * Math.sqrt( X ) ;`

b. `y = sqrt(38.0);`

c. `y = Math.exp(2, 3);`

d. `y = math.sqrt( b*b - 4*a*c) / ( 2 * a );`

a. *(1/2) is always 0.*

b. *Should be Math.sqrt*

c. *No such Math method*

d. *The class name is Math, not math.*

2. If another programmer writes the following statements, do you suspect any misunderstanding on the part of this programmer? What will be the value of y?

a. `y = Math.sin( 360 ) ;`

b. `y = Math.cos( 45 ) ;`

*Yes, most likely this programmer is thinking that he is passing the angles in degrees to the sin and cos methods. The methods accept the angle in radians.*

a. *y = 0.9589*

b. *y = 0.5253*

### 3.8 The GregorianCalendar Class

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No Quick Check Questions.

**3.9 Sample Program: Loan Calculator**

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No Quick Check Questions.

**3.10 Numerical Representation (Optional)**

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No Quick Check Questions.

