

Methods and Classes Test 1

1. In baseball a player's batting average is calculated by dividing the number of hits by the number of times the player has batted. Assume the following class has been defined.

```
public class Baseball
{
    /* precondition: atBats > 0
    * postcondition: a batting average has been computed
    * @ param hits the number of hits
    * @ param atBats the number of atBats
    * @ return the batting average
    */
    public static double average(int hits, int atBats)
    {
        // implementation not shown
    }

    // other methods not shown
}
```

Which of the following best demonstrates the use of method average as a static method when it is called from a method in another class?

- A. average(100, 300);
 - B. player.average();
 - C. Baseball.average(100, 300);
 - D. baseball.average(100, 300);
2. The area of a rectangle is calculated by multiplying the length times the width. Assume the following class has been defined.

```
public class Rectangle
{
    * postcondition: the area has been computed
    * @ return the area
    */
    public double area()
    {
        // implementation not shown
    }

    // other methods not shown
}
```

Given the following definition:

```
Rectangle rect = new Rectangle();
```

Which of the following lines of code will correctly calculate the area of a rectangle?

- A. `Rectangle.area();`
- B. `rect.area();`
- C. `area();`
- D. `rect.area(length, width);`

3. Look at the following method declaration

```
public _____ sum(double num1, double num2) {  
    return num1 + num2;  
}
```

Which of the following can be inserted into the blank so that the method will correctly calculate and return the sum of num1 and num2?

- A. `void`
- B. `static`
- C. `int`
- D. `double`

4. Look at the following method declaration

```
public void play(int a)
```

Which of the following will **not** correctly overload the method **play**?

- A. `public int play(int a)`
- B. `public void play()`
- C. `public void play(int a, int b)`
- D. `public void play(double a)`

5. Look at the following code segment.

```
public class Demo {  
    public static void go(int num) {  
        num = num + 100;  
    }  
  
    public static void main(String[] args) {  
        int number = 25;  
        go(number);  
        System.out.println(number);  
    }  
}
```

What would be output by the code above?

- A. 25
- B. 100
- C. 125
- D. No output due to a run-time error

Questions 6-10 involve questions related to the following class.

```
public class Fraction
{
    private int num;        // numerator
    private int denom;      // denominator

    public Fraction(int n, int d)
    {
        num = n;
        denom = d;
    }

    public int getNum()
    {
        return num;
    }

    public int getDenom()
    {
        return denom;
    }

    public void setNum(int n)
    {
        num = n;
    }

    public void setDenom(int d)
    {
        denom = d;
    }

    public String toString()
    {
        return num + "/" + denom;
    }
}
```

6. Which of the following will correctly instantiate a Fraction object?

- A. num = 3;
denom = 4;
- B. Fraction f = new Fraction();
- C. Fraction f = new Fraction(3, 4);
- D. Fraction.num = 3;
Fraction.denom = 4;

7. Assume a fraction object has been created and its reference is stored in a variable named `frac`. Which of the following will correctly modify the numerator value of a fraction?

- A. `frac.setNum(5);`
- B. `num = 5;`
- C. `Fraction.num = 5;`
- D. `frac.getNum() = 5;`

8. Assume a fraction object has been created and its reference is stored in a variable named `frac`. Which of the following will **not** print `frac` in the form 3/4?

- A. `System.out.println(frac.getNum() + "/" + frac.getDenom());`
- B. `System.out.println(frac.toString());`
- C. `System.out.println(frac);`
- D. `System.out.println(num + "/" + denom);`

9. Suppose the following **equals** method is added to the `Fraction` class.

```
public boolean equals(Fraction other)
{
    return /* code implementation */
}
```

Which of the following lines will **not** correctly replace `/* code implementation */` so that two fractions can be compared for equality?

- A. `this.num == other.num && this.denom == other.denom;`
- B. `num == other.num && denom == other.denom;`
- C. `getNum() == num && getDenom() == denom;`
- D. `this.getNum() == other.getNum() && this.getDenom() == other.getDenom();`

10. Which line contains a syntax error?

```
Line 1 : Fraction frac = new Fraction();
Line 2 : frac.setNum(3);
Line 3 : frac.setDenom(frac.getNum());
Line 4 : System.out.println(frac.getNum() + "/" + frac.getDenom());
```

- A. Line 1
- B. Line 2
- C. Line 3
- D. Line 4

Free Response

1. Write a complete class definition for a class that represents a rectangle. The class should include the following:
 - Two **instance variables** representing the length and width of a rectangle.
 - Two **constructors** - a no parameter (default) constructor and a two parameter constructor that will initialize the two instance variables.
 - An **accessor** method for each instance variable.
 - A **mutator** method for each instance variable.
 - A method named **area** that will calculate and return the area of a rectangle.
 - A **toString** method that will label and display the value of each instance variable.