

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Worksheet 7.3: Inheritance & Polymorphism**

1. Define each of the following terms:

- |                       |                    |
|-----------------------|--------------------|
| a. Method overloading | d. Polymorphism    |
| b. Method overriding  | e. Static Binding  |
| c. Inheritance        | f. Dynamic Binding |

Questions 2 – 5 refer to the following segments:

```
public class ClassOne{

    public void methodOne(){
        System.out.println("Method One, Class One");
    }

    public int methodTwo(){ return 5; }

    public void methodThree(){
        System.out.println("Method Three, Class One");
    }
}

public class ClassTwo extends ClassOne{
    public void methodThree(){
        System.out.println("Method Three, Class Two");
    }
}

public class ClassThree extends ClassTwo{
    public int methodTwo(){ return 10;}
}

public class ClassFour extends ClassOne{
    public int methodTwo() { return super.methodTwo() + 5;}

    public void methodFour(){
        System.out.println("Method Four, Class Four");
    }
}
```

2. Draw an inheritance hierarchy for the classes listed above.

3. Which methods above are overloaded?

4. Which are overridden?

5. Which of the following are legal declarations?

- I. `ClassTwo c1 = new ClassOne();`
- II. `ClassThree c2 = new ClassFour();`
- III. `ClassOne c3 = new ClassThree();`

- A. I only
- B. III only
- C. I and III only
- D. All of the above
- E. None of the above

6. Given the following declarations:

```
ClassOne c1 = new ClassOne();  
ClassOne c2 = new ClassFour();
```

Which of the following will cause a *compile-time* error?

- A. `c1.methodOne();`
- B. `c1.methodThree();`
- C. `c2.methodThree();`
- D. `c2.methodOne();`
- E. `c1.methodFour();`

7. Given the following declarations:

```
ClassOne c1 = new ClassThree();  
ClassOne c2 = new ClassFour();
```

Which of the following will cause a *compile-time* error?

- A. `c1.methodOne();`
- B. `((ClassTwo) c2).methodFour();`
- C. `c2.methodTwo();`
- D. `((ClassFour) c2).methodFour();`
- E. `((ClassTwo) c1).methodTwo();`

8. What will the value of x, y, and z be after the following code segment?

```
ClassOne c1 = new ClassThree();  
ClassOne c2 = new ClassFour();  
ClassOne c3 = new ClassTwo();  
int x = c1.methodTwo();  
int y = c2.methodTwo();  
int z = c3.methodTwo();
```