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| **APCS Exposure Java** | **Exercises 16.07-10** | **Date:** |
| **Name:** | | **Period:** |

1. Methods **toString** and **equals** have been defined for many Java standard classes.

Can these methods also be defined for user-defined classes?

2. What is the name of the *ultimate superclass* – the class that all other classes inherit from?

3. When you create a class, is it necessary to use the **extends** keyword to state that this class inherits from Object?

4. If **x** is a **String**, what is displayed by this statement: **System.out.println(x);** ?

5. If **x** is a *primitive data type*, what is displayed by this statement: **System.out.println(x);** ?

6. If *x* is a *Java static array* of**double**, what is displayed by this statement: **System.out.println(x);** ?

7. What method is checked by **print** and **println** to see how the information needs to be displayed?

8. The **Object** class has a **toString** method. How does it display an object?

9. Why is it that every class has access to the **toString** method?

10. If *x* is an **ArrayList** object, what is displayed by this statement: **System.out.println(x);** ?

11. Refer to the previous question. Why does this not display a memory address like other objects?

12. Look at program ***Java1618.java***.

This program shows the **toString** method being called explicitly. Is that necessary?

13. Look at program ***Java1619.java***.

Rewrite the **toString** method below so that it will display this output instead:

**Name: Kathy Alexander**

**Name: Peter VanVliet**

14. Is the **toString** method limited to displaying the value of only one field?

15. Why does operator == not work for objects?

16. What method should be used to compare objects?

17. Look at program ***Java1622.java***. We know the **equals** method works for **String**s.

Why is it not working here?

18. Look at programs ***Java1623.java*** and ***Java1624.java***.

Rewrite the **equals** below so that people will be considered equal if their *ages* and *salaries* are equal.

19. Refer to the previous question.

Rewrite the **equals** below so that it would be consistent with the statement that

“*everybody is different*.”

20. What is the purpose of the **this** reference?

21. Is using the **this** reference required?