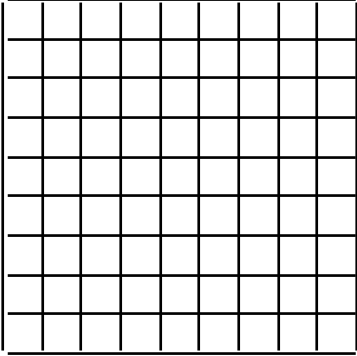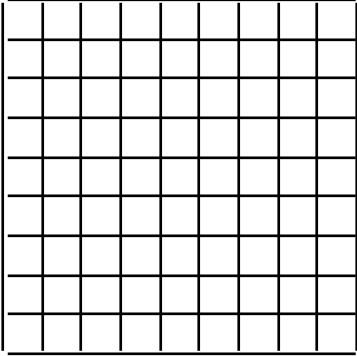# AP CS A
Unit 2. Using Objects. Exercises

Assume all code runs unless suggested otherwise.

1. Is there a Cat class?
a)   Yes, there must be.
b)   No, it is not required for this code to run.
 	
2. How many Cat objects are instantiated?
 	
3. The *meow* method
a) has no parameters.
b) has one parameter.
c) has two parameters.
 	
4. The return type of the *meow* method is:
a) int
b) double
c) boolean
 	
5. The *purr* method
a) has no parameters.
b) has one parameter.
 	
6. The return type of the *purr* method is:
a) int
b) double
c) boolean
	``java
	public class Main {
	    public static void main(String[] args) {
	        Cat a = new Cat();
	        Cat b = new Cat();
	        int n = 5;
	        double x = b.meow(n, 7);
	        boolean boo = a.purr();
	    }
	}
	``

7. How many objects are created?
 	
8. What parameters does the nextInt method have?
a) one int parameter
b) no parameters
 	
9. *nextInt* is a method of what class?
a) sal
b) Scanner
c) Main
 	
10. What is the return type of *balance*?
	``java
	import java.util.Scanner;
	
	public class Main {
	    public static void main(String[] args) {
	        Scanner sal = new Scanner(System.in);
	        System.out.println("Enter a number ");
	        int n1 = sal.nextInt();
	
	        Seal gh = new Seal(n1);
	        double num = gh.balance(true, 14);
	    }
	}
	``

11. What is displayed? Use the grid if it helps.	// the code is in the main method of some class.

	Rectangle a = new Rectangle(-3, 4, -1, 5);
	int n = a.getX();
	System.out.println(n); _____
	a.translate(2, 1);
	n = a.getX();
	System.out.println(n); _____
	
	System.out.println(a.diagonal()); _____

12. What is displayed? Use the grid if it helps.	// the code is in the main method of some class.

	Rectangle rachel = new Rectangle(3, 4);
	Rectangle rose = new Rectangle(-2, -1, 2, 4);
	int num = rose.getY();
	System.out.println(num); _____
	num = rachel.getY();
	System.out.println(num); _____
	
	boolean a = rose.contains(0, 3);
	System.out.println(a); _____
	a = rachel.contains(0, 3);
	System.out.println(a); _____

13. Complete the code below so that one rectangle is created. Its lower left-hand corner is at (12, 17) and its width is 10 and its height is 20. Then call the diagonal method and print the value that is returned. Finally, translate the rectangle two units down and call the getY method. Print the rectangle's y coordinate.

```
public class Main {
    public static void main(String[] args) {

        Rectangle box = _____

        _____                 // call the diagonal method

        System.out.println( k );                                    // printing the length of the diagonal

        _____                   // translate the rectangle two units down

        _____                   // call the getY method

        System.out.println( n );                                    // printing the y coordinate

    }
}
```

14. Complete the code so that the program runs correctly. The user enters the coordinates to define a rectangle. Then the area method is called, and the returned value is printed. Then translate the rectangle 3 units up and 1 unit to the right. Then call the getX method and print the returned value.

```java
import java.util.Scanner;

class Main {
        public static void main(String[] args) {
                Scanner sc = new Scanner( System.in );
                System.out.println("Enter the x and y coordinates for the lower left-hand corner.");
                int x1 = sc.nextInt();
                int y1 = sc.nextInt();
                System.out.println("Enter the x and y coordinates for the upper right-hand corner.");
                int x2 = sc.nextInt();
                int y2 = sc.nextInt();

        Rectangle r = _____          // create a rectangle object

        _____                 // call the area method

        System.out.println( g );                                      // this should print the area

        _____                 // move 3 units up, 1 unit to the right

        _____                 // call the getX method

        System.out.println( h );                                      // this should print the new y coordinate
        }
}
```

15. What is printed?	String a = "x"; a = a + "b"; a = "c" + a; System.out.println(a);
16. What is printed? 17. How many string literals are there in this code snippet?	String b = "pop"; b += "e"; b += "s"; System.out.println(b);

18. Which line(s) contain an addition operator? If none do, write NONE.
 	
19. Which line(s) contain a concatenation operator? If none do, write NONE.
 	
20. What is printed?
	int g = 4 + 5; // Line 1
	String h = "6" + "7"; // Line 2
	System.out.println(g + h); // Line 3
	System.out.println(h + g); // Line 4

21. What is printed?	String x = "A//B\\C"; System.out.println(x);
22. What is printed?	String y = "\"G\n\"\\"; System.out.println(y);
23. Select the TRUE statement. a) This does not run. b) It runs and prints \\ c) It runs and prints \	String z = "\" + "\"; System.out.println(z);

24. Select the TRUE statement.
a) This does not run.
b) It runs and prints   2
                       3
	int a = 2;
	int b = 3;
	String c = a + "\n" + b;
	System.out.println(c);

25. What is displayed?	String s = "ok go!"; // a space between words
	System.out.println(s.length());

26. What is displayed?	String s1 = "apple"; String s2 = s1.substring(2); System.out.println(s2);
27. What is displayed?	String g = "course"; String h = g.substring(0, 1); String j = g.substring(0, 1); System.out.println(h+j);
28. What method of the Scanner class returns a String object? 29. If the user enters *balloon*, what is printed? 30. If the user enters *DOG*, what is printed?	Scanner sam = new Scanner(System.in); System.out.println("Enter a string "); String s = sam.nextLine(); int n = s.length(); String a = s.substring(n - 2); System.out.println(a);
31. If the user enters *boats*, what is printed? 32. If the user enters *bug*, what is printed?	Scanner sam = new Scanner(System.in); System.out.println("Enter a string "); String s = sam.nextLine(); int n = s.length(); String b = s.substring(1, n - 1); System.out.println(b);
33. What is printed?	String z = "BARN"; z = z.substring(1); z = z.substring(1); System.out.println(z);
34. What is printed? This runs but is a little tricky.	String z = "BARN"; z.substring(1); z.substring(1); System.out.println(z);

35. What is printed?	String a = "there their the"; int n1 = a.indexOf("the"); System.out.println(n1);
36. What is printed?	String a = "there their the"; int n1 = a.indexOf("The"); System.out.println(n1);

37. What is printed?	String a = "eerie";
	int n1 = a.indexOf("e");
	System.out.println(n1);
	int n2 = a.indexOf("e", 0);
	System.out.println(n2);
	int n3 = a.indexOf("e", 3);
	System.out.println(n3);

38. What is printed?	String w = "banana";
	int k = w.indexOf("n");
	System.out.println(k);
	k += 1;
	k = w.indexOf("n", k);
	System.out.println(k);
	k += 1;
	k = w.indexOf("n", k);
	System.out.println(k);

39. What is printed?	String a = "$$"; String b = "$"; System.out.println(a.equals(b));
40. What is printed?	String a = "Pony"; String b = "pony"; System.out.println(a.equals(b));
41. What is displayed? a) hop, hop b) HOP, hop	String s4 = "HOP"; String s5 = s4.toLowerCase(); System.out.println(s4 + ", " + s5);
42. What is displayed? a) TREE, tree b) tree, tree	String s8 = "TREE"; String s9 = s8.toLowerCase(); s8.toLowerCase(); System.out.println(s8 + ", " + s9);

43. How many parameters does the String class's length method have? _____

44. What is the return type of the equals method? _____

45. What is displayed?	String s1 = ""; int n = s1.length(); System.out.println(n);
46. This prints a) a positive number b) a negative number	String a = "ponies"; String b = "pony"; System.out.println(a.compareTo(b));

47. This prints a) a positive number b) a negative number	String a = "jackel"; String b = "ibis"; System.out.println(a.compareTo(b));

48. This prints a) 10 b) 10.0	System.out.println(Math.sqrt(100));

49. This code does not compile. The error message is:
     Type mismatch: cannot convert from double to int
What is the problem?
	int x = 49;
	int y = Math.sqrt(x);
	System.out.println(y);

50. What is the value of y? 51. If the data type of y was changed to int, would the code still run?	double x = -14; double y = Math.abs(x);

52. What is printed?	double z1 = Math.pow(3, 0);
	System.out.println(z1);
	double z2 = Math.pow(0, 3);
	System.out.println(z2);

53. *n* is a random integer in the range: [_____, _____]	int n = (int)(8 * Math.random()) + 4;
54. There is an error in this statement. What is the problem?	int x = (int) 6 *Math.random();
55. *k* is a random integer in the range: [_____, _____]	int k = (int)(100 * Math.random());
56. *k* is a random integer in the range: [_____, _____]	int q = (int)(6 * Math.random()) - 4;

57. List all the integers that might be printed.	int m = (int)(3 * Math.random()) + 1;
	m = 3*m;
	System.out.println(m);

58. Complete the code so that *h* is assigned a random integer in the range [10, 16]

    int h = _____

59. Complete the code so that *num* is assigned a random integer in the range [- 12, -4]

    int num = _____