AP CS A

Unit 2. Using Objects. Exercises

Assume all code runs unless suggested otherwise. all code compiles and runs.

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? 2
2 new Cat() used!

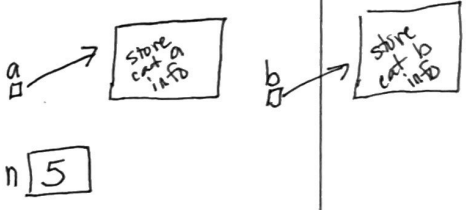
3. The *meow* method
a) has no parameters.
b) has one parameter.
c) has two parameters.

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

```
public class Main {
    public static void main(String[] args) {
        Cat a = new Cat(); // instantiate Cat object
        Cat b = new Cat(); //      "       "
        int n = 5;
        double x = b.meow( n, 7 );  // call meow method for b Cat
        boolean boo = a.purr(); // call purr method for a Cat.
    }
}
```



7. How many objects are created? 2 { sal, gh

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

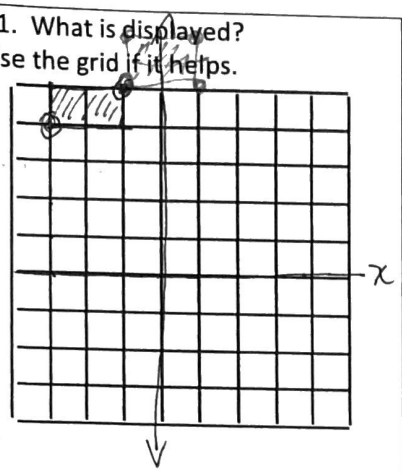
10. What is the return type of *balance*?
double

```
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.

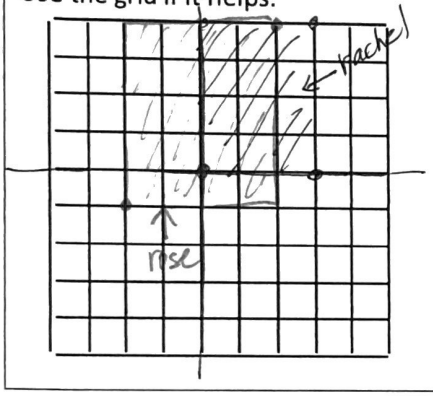


```
// the code is in the main method of some class.

Rectangle a = new Rectangle( -3, 4, -1, 5 );
int n = a.getX();                                  -3
System.out.println( n );
a.translate( 2, 1 );
n = a.getX();                                      -1
System.out.println( n );
System.out.println( a.diagonal() );                2.23
```

$\sqrt{2^2+1^2} = \sqrt{5}$

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();                             -1
System.out.println( num );
num = rachel.getY();                               0
System.out.println( num );

boolean a = rose.contains( 0, 3 );                 true
System.out.println( a );
a = rachel.contains( 0, 3);                        false
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.

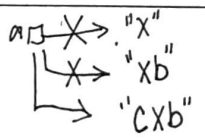
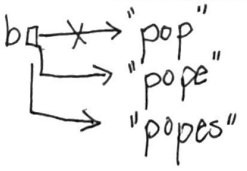
```
public class Main {
    public static void main(String[] args) {
        Rectangle box = new Rectangle(12, 17, 10, 20);
        double k = box.diagonal();          // call the diagonal method
        System.out.println( k );            // printing the length of the diagonal
        box.translate(0, -2)                // translate the rectangle two units down
        int n = box.getY()                  // 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.

```
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 = new Rectangle(x1, y1, x2, y2);        // create a rectangle object
        int g = r.area();                                   // call the area method
        System.out.println( g );                            // this should print the area
        r.translate(1, 3);                                  // move 3 units up, 1 unit to the right
        int h = r.getX();                                   // call the getX method
        System.out.println( h );                            // this should print the new y coordinate
        }
}
```

15. What is printed? CXb	String a = "x"; a = a + "b"; a = "c" + a; System.out.println(a); 
16. What is printed? popes 17. How many string literals are there in this code snippet? 3	String b = "pop"; b += "e"; b += "s"; System.out.println(b); 

18. Which line(s) contain an addition operator? If none do, write NONE. line 1
 	
19. Which line(s) contain a concatenation operator? If none do, write NONE. line 2, line 3, line 4
 	
20. What is printed? 967
679
	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? A//B\C	String x = "A//B\\C"; System.out.println(x);
22. What is printed? "G "\	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?
6
	String s = "ok go!"; // a space between words
	System.out.println(s.length());

26. What is displayed? ple	String s1 = "apple"; String s2 = s1.substring(2); System.out.println(s2);
27. What is displayed? cc	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? nextLine 29. If the user enters *balloon*, what is printed? on 30. If the user enters *DOG*, what is printed? OG	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? oat 32. If the user enters *bug*, what is printed? u	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? RN	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. BARN	String z = "BARN"; z.substring(1); z.substring(1); System.out.println(z);

35. What is printed? 0	String a = "there their the"; int n1 = a.indexOf("the"); System.out.println(n1);
36. What is printed? -1	String a = "there their the"; int n1 = a.indexOf("The"); System.out.println(n1);

37. What is printed?
0
0
4
	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?
2
4
-1
	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? false	String a = "$$"; String b = "$"; System.out.println(a.equals(b)); (false)
40. What is printed? false	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? 0

44. What is the return type of the equals method? ~~int~~ boolean

large sm larger

45. What is displayed? 0	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"; sm - larger System.out.println(a.compareTo(b));

System.out.println(n);

int n=5
String s = "" + n; + n;

"5"

47. This prints (a) a positive number b) a negative number	String a = "jackel"; String b = "ibis"; sm 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? sqrt returns a double
	int x = 49;
	int y = Math.sqrt(x);
	System.out.println(y);

50. What is the value of y? 14.0 51. If the data type of y was changed to int, would the code still run? yes bc we have an overloaded method	double x = -14; double y = Math.abs(x);

52. What is printed?
1.0
0.0
z1 [1.0]
z2 [0.0]
	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: [4 , 11]	[0 .. 7] + 4 int n = (int)(8 * Math.random()) + 4; 0 7.999
54. There is an error in this statement. What is the problem? (int) cast only applies to 6 so we still have a double on right side.	int x = (int) 6 *Math.random(); = 6 * (0 ... .999)
55. *k* is a random integer in the range: [0 , 99]	int k = (int)(100 * Math.random());
56. *k* is a random integer in the range: [-4 , 1]	int q = (int)(6 * Math.random()) - 4; 0 - 5
57. List all the integers that might be printed. 1 ... 3 1, 2, 3 so 3, 6, or 9	int m = (int)(3 * Math.random()) + 1; m = 3*m; 0 ... 2 System.out.println(m);

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

int h = (int)(7 * Math.random()) + 10;

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

int num = (int)(9 * Math.random()) + -12

or -12

range

-4 - -12 + 1

-4 + 12 + 1 = 9