

Practice test 2

1. Consider the following methods, which appear in the same class.

```
public void slope(int x1, int y1, int x2, int y2)
{
    int xChange = x2 - x1;
    int yChange = y2 - y1;
    printFraction(yChange, xChange);
}
```

```
public void printFraction(int numerator, int denominator)
{
    System.out.print(numerator + "/" + denominator);
}
```

Assume that the method call `slope(1, 2, 5, 10)` appears in a method in the same class. What is printed as a result of the method call?

☒ A 8/4



☐ B 5/1

☐ C 4/8

☐ D 2/1

☐ E 1/5



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2. Consider the following method, which is intended to calculate and return the expression

$$\sqrt{\frac{(x+y)^2}{|a-b|}}.$$

```
public double calculate(double x, double y, double a, double b)
{
    return /* missing code */;
}
```

Which of the following can replace */* missing code */* so that the method works as intended?

- (A) `Math.sqrt(x ^ 2, y ^ 2, a - b)`
- (B) `Math.sqrt((x + y) ^ 2) / Math.abs(a, b)`
- (C) `Math.sqrt((x + y) ^ 2 / Math.abs(a - b))`
- (D) `Math.sqrt(Math.pow(x + y, 2) / Math.abs(a, b))`
- (E) `Math.sqrt(Math.pow(x + y, 2) / Math.abs(a - b))` ✓

3. Consider the following method.

```
public double myMethod(int a, boolean b)
{ /* implementation not shown */ }
```

Which of the following lines of code, if located in a method in the same class as `myMethod`, will compile without error?

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- (A) `int result = myMethod(2, false);`
- (B) `int result = myMethod(2.5, true);`
- (C) `double result = myMethod(0, false);` ✓
- (D) `double result = myMethod(true, 10);`
- (E) `double result = myMethod(2.5, true);`
-

4. Consider the following code segment.

```
double num = 9 / 4;  
System.out.print(num);  
System.out.print(" ");  
System.out.print((int) num);
```

What is printed as a result of executing the code segment?

- (A) 2 2
- (B) 2.0 2 ✓
- (C) 2.0 2.0
- (D) 2.25 2
- (E) 2.25 2.0
-



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5. Consider the following code segment.

```
double x = (int) (5.5 - 2.5);
```

```
double y = (int) 5.5 - 2.5;
```

```
System.out.println(x - y);
```

What is printed as a result of executing the code segment?

(A) -1.0

(B) -0.5

(C) 0.0

(D) 0.5



(E) 1.0

-
6. Consider the following code segment.

```
int w = 1;
```

```
int x = w / 2;
```


```
double y = 3;
```

```
int z = (int) (x + y);
```

Which of the following best describes the results of compiling the code segment?



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- ☒ A The code segment compiles without error. 
- ☐ B The code segment does not compile, because the int variable x cannot be assigned the result of the operation $w / 2$.
- ☐ C The code segment does not compile, because the integer value 3 cannot be assigned to the double variable y.
- ☐ D The code segment does not compile, because the operands of the addition operator cannot be of different types int and double.
- ☐ E The code segment does not compile because the result of the addition operation is of type double and cannot be cast to an int.
-


7. Consider the following code segment.

```
double x = 4.5;
```

```
int y = (int) x * 2;
```

```
System.out.print(y);
```

What is printed as a result of executing the code segment?

- ☒ A 8 
- ☐ B 8.0
- ☐ C 9
- ☐ D 9.0
- ☐ E 10
-

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8. The code segment below is intended to calculate the circumference c of a circle with the diameter d of 1.5. The circumference of a circle is equal to its diameter times π .

```
/* missing declarations */
```

```
c = pi * d;
```

Which of the following variable declarations are most appropriate to replace

/ missing declarations */* in this code segment?

```
int pi = 3.14159;
```

- ☐ A int d = 1.5;
final int c;

```
final int pi = 3.14159;
```

- ☐ B int d = 1.5;
int c;

```
final double pi = 3.14159;
```

- ☒ C double d = 1.5;
double c;



```
double pi = 3.14159;
```

- ☐ D double d = 1.5;
final double c = 0.0;

```
final double pi = 3.14159;
```

- ☐ E final double d = 1.5;
final double c = 0.0;

-
9. Consider the following code segment.

```
String temp = "comp";
```

```
System.out.print(temp.substring(0) + " " +
```

```
temp.substring(1) + " " +
```

```
temp.substring(2) + " " +
```

```
temp.substring(3));
```

What is printed when the code segment is executed?



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- (A) comp
- (B) c o m p
- (C) comp com co c
- (D) comp omp mp p
- (E) comp comp comp comp
-

10. Consider the following code segment.

```
int a = 5;  
int b = 4;  
int c = 2;  
a *= 3;  
b += a;  
b /= c;  
System.out.print(b);
```

What is printed when the code segment is executed?

- (A) 2
- (B) 4
- (C) 9
- (D) 9.5
- (E) 19
-



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11. Consider the following code segment.

```
String str = "CompSci";
```

```
System.out.println(str.substring(0, 3));
```

```
int num = str.length();
```

What is the value of num when the code segment is executed?

(A) 3

(B) 4

(C) 5

(D) 6

(E) 7



-
12. Consider the following code segment.

```
String str = "0";
```

```
str += str + 0 + 8;
```

```
System.out.println(str);
```

What is printed as a result of executing the code segment?



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(A) 8

(B) 08

(C) 008

(D) 0008



(E) Nothing is printed, because numerical values cannot be added to a String object.

13. Consider the following code segment.

```
int one = 1;
```

```
int two = 2;
```

```
String zee = "Z";
```

```
System.out.println(one + two + zee);
```

What is printed as a result of executing the code segment?

(A) 12Z

(B) 3Z



(C) 12zee

(D) 3zee

(E) onetwozee

Directions: Select the choice that best fits each statement. The following question(s) refer to the following incomplete class declaration.



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```

public class TimeRecord
{
    private int hours;
    private int minutes; // 0 ≤ minutes < 60
    /** Constructs a TimeRecord object.
     * @param h the number of hours
     *      Precondition:  $h \geq 0$ 
     * @param m the number of minutes
     *      Precondition:  $0 \leq m < 60$ 
     */
    public TimeRecord(int h, int m)
    {
        hours = h;
        minutes = m;
    }

    /** @return the number of hours
     */
    public int getHours()
    { /* implementation not shown */ }

    /** @return the number of minutes
     *   Postcondition:  $0 \leq \text{minutes} < 60$ 
     */
    public int getMinutes()
    { /* implementation not shown */ }

    /** Adds h hours and m minutes to this TimeRecord.
     * @param h the number of hours
     *      Precondition:  $h \geq 0$ 
     * @param m the number of minutes
     *      Precondition:  $m \geq 0$ 
     */
    public void advance(int h, int m)
    {
        hours = hours + h;
        minutes = minutes + m;
        /* missing code */
    }
    // Other methods not shown
}

```

14. Consider the following declaration that appears in a class other than TimeRecord.
- ```
TimeRecord [] timeCards = new TimeRecord [100];
```

Assume that timeCards has been initialized with TimeRecord objects. Consider the following code segment that is intended to compute the total of all the times stored in timeCards.

```

TimeRecord total = new TimeRecord(0,0);
for (int k = 0; k < timeCards.length; k++)
{
 /* missing expression */ ;
}

```

Which of the following can be used to replace */\* missing expression \*/* so that the code segment will work as intended?



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- (A) `timeCards [ k ] .advance ( )`
- (B) `total += timeCards [ k ] .advance ( )`
- (C) `total.advance(timeCards[k].hours,  
timeCards[k].minutes)`
- (D) `total.advance(timeCards[k].getHours(),  
timeCards[k].getMinutes())` ✓
- (E) `timeCards[k].advance(timeCards[k].getHours(),  
timeCards[k].getMinutes())`
- 

15. Consider the following method.

```
public int getTheResult(int n)
{
 int product = 1;
 for (int number = 1; number < n; number++)
 {
 if (number % 2 == 0)
 product *= number;
 }
 return product;
}
```

What value is returned as a result of the call `getTheResult(8)` ?

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**(A)** 48**(B)** 105**(C)** 384**(D)** 5040**(E)** 40320

---

16. Consider the following method.

```
public int mystery(int num)
{
 int x = num;
 while (x > 0)
 {
 if (x / 10 % 2 == 0)
 return x;
 x = x / 10;
 }
 return x;
}
```

What value is returned as a result of the call `mystery(1034)` ?



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(A) 4

(B) 10

(C) 34

(D) 103



(E) 1034

---

17. Consider the following method.

```
public int pick(boolean test, int x, int y)
{
 if (test)
 return x;
 else
 return y;
}
```

What value is returned by the following method call?

`pick(false, pick(true, 0, 1), pick(true, 6, 7))`

(A) 0

(B) 1

(C) 3

(D) 6



(E) 7

---



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18. Consider the following code segment.

```
int x = 5;
int y = 6;
/* missing code */
z = (x + y) / 2;
```

Which of the following can be used to replace */\* missing code \*/* so that the code segment will compile?

1. `int z = 0;`
2. `int z;`
3. `boolean z = false;`

(A) I only

(B) II only

(C) I and II only



(D) II and III only

(E) I, II, and III

---

19. A code segment (not shown) is intended to determine the number of players whose average score in a game exceeds 0.5. A player's average score is stored in `avgScore`, and the number of players who meet the criterion is stored in the variable `count`. Which of the following pairs of declarations is most appropriate for the code segment described?



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(A) double avgScore;  
boolean count;

(B) double avgScore;  
double count;

(C) double avgScore;  
int count;



(D) int avgScore;  
boolean count;

(E) int avgScore;  
int count;

---

**20.** The Student class has been defined to store and manipulate grades for an individual student. The following methods have been defined for the class.

`/* Returns the sum of all of the student's grades */`

`public double sumOfGrades()`

`{ /* implementation not shown */ }`

`/* Returns the total number of grades the student has received */`

`public int numberOfGrades()`

`{ /* implementation not shown */ }`

`/* Returns the lowest grade the student has received */`

`public double lowestGrade()`

`{ /* implementation not shown */ }`

Which of the following statements, if located in a method in the Student class, will determine the average of all of the student's grades except for the lowest grade and store the result in the double variable newAverage ?



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- (A) `newAverage = sumOfGrades() / numberOfGrades() - 1;`
- (B) `newAverage = sumOfGrades() / (numberOfGrades() - 1);`
- (C) `newAverage = sumOfGrades() - lowestGrade() / (numberOfGrades() - 1);`
- (D) `newAverage = (sumOfGrades() - lowestGrade()) / numberOfGrades() - 1;`
- (E) `newAverage = (sumOfGrades() - lowestGrade()) / (numberOfGrades() - 1);` ✓
- 

**21.** Consider the following method.

```
public void doSomething()
{
 System.out.println("Something has been done");
}
```

Each of the following statements appears in a method in the same class as `doSomething`. Which of the following statements are valid uses of the method `doSomething`?

1. `doSomething();`
2. `String output = doSomething();`
3. `System.out.println(doSomething());`



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(A) I only



(B) II only

(C) I and II only

(D) I and III only

(E) I, II, and III

---

**22.** Consider the following code segment.

```
double d1 = 10.0;
```

```
Double d2 = 20.0;
```

```
Double d3 = new Double(30.0);
```

```
double d4 = new Double(40.0);
```

```
System.out.println(d1 + d2 + d3.doubleValue() + d4);
```

What, if anything, is printed when the code segment is executed?

(A) 100.0



(B) 10.050.040.0

(C) 10.020.070.0

(D) 10.020.030.040.0

(E) There is no output due to a compilation error.

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23. Consider the following class definition.

```
public class ExamScore
{
 private String studentId;
 private double score;
 public ExamScore(String sid, double s)
 {
 studentId = sid;
 score = s;
 }
 public double getScore()
 {
 return score;
 }
 public void bonus(int b)
 {
 score += score * b/100.0;
 }
}
```

Assume that the following code segment appears in a class other than ExamScore.

```
ExamScore es = new ExamScore("12345", 80.0);
es.bonus(5);
System.out.println(es.getScore());
```

What is printed as a result of executing the code segment?



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(A) 4.0

(B) 5.0

(C) 80.0

(D) 84.0



(E) 85.0

---

**24.** Assume that the boolean variables *a* and *b* have been declared and initialized. Consider the following expression.

**`(a && (b || !a)) == a && b`**

Which of the following best describes the conditions under which the expression will evaluate to true?

(A) Only when *a* is true

(B) Only when *b* is true

(C) Only when both *a* and *b* are true

(D) The expression will never evaluate to true.

(E) The expression will always evaluate to true.



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25. Assume that the boolean variables *a*, *b*, *c*, and *d* have been declared and initialized. Consider the following expression.

`!( (a && b) || (c || !d) )`

Which of the following is equivalent to the expression?

**A** `( a && b ) && ( !c && d )`



**B** `( a || b ) && ( !c && d )`

**C** `( a && b ) || ( c || !d )`

**D** `( !a || !b ) && ( !c && d )`

**E** `!( a && b ) && ( c || !d )`

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26. At a certain high school students receive letter grades based on the following scale.

| <u>Integer Score</u>    | <u>Letter Grade</u> |
|-------------------------|---------------------|
| 93 or above             | A                   |
| From 84 to 92 inclusive | B                   |
| From 75 to 83 inclusive | C                   |
| Below 75                | F                   |

Which of the following code segments will assign the correct string to grade for a given integer score ?

- I. 

```
if (score >= 93)
 grade = "A";
if (score >= 84 && score <= 92)
 grade = "B";
if (score >= 75 && score <= 83)
 grade = "C";
if (score < 75)
 grade = "F";
```
- II. 

```
if (score >= 93)
 grade = "A";
if (84 <= score <= 92)
 grade = "B";
if (75 <= score <= 83)
 grade = "C";
if (score < 75)
 grade = "F";
```
- III. 

```
if (score >= 93)
 grade = "A";
else if (score >= 84)
 grade = "B";
else if (score >= 75)
 grade = "C";
else
 grade = "F";
```



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- (A) II only
- (B) III only
- (C) I and II only
- (D) I and III only
- (E) I, II, and III
- 



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27. Consider the following code segment, which is intended to simulate a random process. The code is intended to set the value of the variable `event` to exactly one of the values 1, 2, or 3, depending on the probability of an event occurring. The value of `event` should be set to 1 if the probability is 70 percent or less. The value of `event` should be set to 2 if the probability is greater than 70 percent but no more than 80 percent. The value of `event` should be set to 3 if the probability is greater than 80 percent. The variable `randomNumber` is used to simulate the probability of the event occurring.

```
int event = 0;
if (randomNumber <= 0.70)
{
 event = 1;
}
if (randomNumber <= 0.80)
{
 event = 2;
}
else
{
 event = 3;
}
```

The code does not work as intended. Assume that the variable `randomNumber` has been properly declared and initialized. Which of the following initializations for `randomNumber` will demonstrate that the code segment will not work as intended?

- ☒ (A) `randomNumber = 0.70;`
- ☐ (B) `randomNumber = 0.80;`
- ☐ (C) `randomNumber = 0.85;`
- ☐ (D) `randomNumber = 0.90;`
- ☐ (E) `randomNumber = 1.00;`



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28. Consider the following code segment.

```
int j = 1;
while (j < 5)
{
 int k = 1;
 while (k < 5)
 {
 System.out.println(k);
 k++;
 }
 j++;
}
```

Which of the following best explains the effect, if any, of changing the first line of code to `int j = 0; ?`

- (A) There will be one more value printed because the outer loop will iterate one additional time.
- (B) There will be four more values printed because the outer loop will iterate one additional time. ✓
- (C) There will be one less value printed because the outer loop will iterate one fewer time.
- (D) There will be four fewer values printed because the outer loop will iterate one fewer time.
- (E) There will be no change to the output of the code segment.
-



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29. Consider the following two code segments where the `int` variable `choice` has been properly declared and initialized.

**Code Segment A**

```
if (choice > 10)
{
 System.out.println("blue");
}
else if (choice < 5)
{
 System.out.println("red");
}
else
{
 System.out.println("yellow");
}
```

**Code Segment B**


```
if (choice > 10)
{
 System.out.println("blue");
}
if (choice < 5)
{
 System.out.println("red");
}
else
{
 System.out.println("yellow");
}
```

**Assume that both code segments initialize `choice` to the same integer value. Which of the following best describes the conditions on the initial value of the variable `choice` that will cause the two code segments to produce different output?**



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- (A) choice < 5
- (B) choice  $\geq 5$  and choice  $\leq 10$
- (C) choice > 10 
- (D) choice == 5 or choice == 10
- (E) There is no value for choice that will cause the two code segments to produce different output.
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30. Consider the following code segments, which are each intended to convert grades from a 100-point scale to a 4.0-point scale and print the result. A grade of 90 or above should yield a 4.0, a grade of 80 to 89 should yield a 3.0, a grade of 70 to 79 should yield a 2.0, and any grade lower than 70 should yield a 0.0.

Assume that `grade` is an `int` variable that has been properly declared and initialized.

**Code Segment I**

```
double points = 0.0;
if (grade > 89)
{
 points += 4.0;
}
else if (grade > 79)
{
 points += 3.0;
}
else if (grade > 69)
{
 points += 2.0;
}
else
{
 points += 0.0;
}
System.out.println(points);
```

**Code Segment II**


```
double points = 0.0;
if (grade > 89)
{
 points += 4.0;
}
if (grade > 79)
{
 grade += 3.0;
}
if (grade > 69)
{
 points += 2.0;
}
if (grade < 70)
{
 points += 0.0;
}
System.out.println(points);
```

**Which of the following statements correctly compares the values printed by the two methods?**



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- A** The two code segments print the same value only when grade is below 80. 
- B** The two code segments print the same value only when grade is 90 or above or grade is below 80.
- C** The two code segments print the same value only when grade is 90 or above.
- D** Both code segments print the same value for all possible values of grade.
- E** The two code segments print different values for all possible values of grade.
- 

**31.** Consider the following methods, which appear in the same class.

```
public int function1(int i, int j)
{
 return i + j;
}
```

```
public int function2(int i, int j)
{
 return j - i;
}
```

Which of the following statements, if located in a method in the same class, will initialize the variable `x` to 11?



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(A) `int x = function2(4, 5) + function1(1, 3);`

(B) `int x = function1(4, 5) + function2(1, 3);`



(C) `int x = function1(4, 5) + function2(3, 1);`

(D) `int x = function1(3, 1) + function2(4, 5);`

(E) `int x = function2(3, 1) + function1(4, 5);`

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32. Consider the following class declaration.

```
public class GameClass
{
 private int numPlayers;
 private boolean gameOver;

 public Game()
 {
 numPlayers = 1;
 gameOver = false;
 }

 public void addPlayer()
 {
 numPlayers++;
 }

 public void endGame()
 {
 gameOver = true;
 }
}
```

Assume that the GameClass object game has been properly declared and initialized in a method in a class other than GameClass. Which of the following statements are valid?

1. game.numPlayers++;
2. game.addPlayer();
3. game.gameOver();
4. game.endGame();



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- (A) IV only
- (B) I and III only
- (C) I and IV only
- (D) II and IV only
- (E) II, III, and IV only
- 

