

# Computer Science 145/148

Midterm 1—Fall 2019

1. What are the type and value of the following expression?

```
9 / 4
```

2. What are the type and value of the following expression?

```
Math.pow(2, 3)
```

3. What are the type and value of the following expression?

```
"13" + 0.6
```

4. Which of the following code sequences will fail to compile or will crash when run? Check zero or more.

(a) 

```
int n = 2765;
int ndigits = n.length();
```

(b) 

```
String s = "f" + 0 + 0;
byte b = (byte) s.length();
```

(c) 

```
System.out.printf("%d\n", 17);
```

(d) 

```
int x = 39;
boolean inRange = (0 <= x <= 100);
```

5. Fill in blanks a, b, c, d, and e with the best answer given the surrounding code.

```
public static ___a___ flashcard() {
    Random generator = new Random();
    ___b___ x = generator.nextInt(11);
    int ___c___ = generator.nextInt(11);
    int product = ___d___;
    System.out.printf("%d * %d = ___e___\n", x, y, product);
}
```

6. Fill in blanks a, b, c, and d with the best answer given the surrounding code.

```
public static ___a___ sum(int start, ___b___ ___c___) {
    int sumFromOne = stop * (stop + 1) / 2;
    int sumToStart = (start - 1) * start / 2;
    int ___d___ = sumToStart - sumFromOne;
    return diff;
}
```

7. Unscramble the following code:

```
a: int length = generator.nextInt(text.length());
b: return prefix;
c: }
d: Random generator = new Random();
e: public static String randomPrefix(String text) {
f: String prefix = text.substring(0, length);
```

The letters to the left are just labels, not actual Java code. For your answer, write only the letter of the first line of code, then the letter of the second, and so on. For example: abcdef.

8. What are the eight primitive types available in Java?
9. Declare a variable named `tau` and assign it the value  $2\pi$ .
10. You see the following documentation for the `Random` class.

Constructors	
Constructor	Description
<code>Random()</code>	Creates a new random number generator.
<code>Random(long seed)</code>	Creates a new random number generator using a single long seed.

Declare and assign a `Random` instance whose seed is 19.

11. Write the interface only for a method named `preview` that accepts a `File` as a parameter and returns its first sentence.
12. Write the interface only for method `slar` based on how it is called in the following code:

```
String s = in.nextLine();
System.out.printf("%d", slar(s.charAt(1), s.startsWith("<")));
```

13. Write a `main` method that prompts and retrieves from the user a number of years. Print a description of the number of years in a style that Abraham Lincoln used to begin his Gettysburg Address. Model your program on this example console interaction, in which the user input is highlighted in gray and spaces are marked with `_`:

```
Enter_years:_ 87
4_score_and_7_years_ago
```

Assume the user enters any positive number of years—not necessarily 87. A score is 20 years. Do not be concerned about the pluralization of the nouns.

14. Write a method named `dimensionsToArea` that accepts as its sole parameter a `String` of a rectangle's integer dimensions separated by an `x`, like `70x7` or `8x10`. Return as an `int` the area of the given rectangle. For example, `dimensionsToArea("70x7")`  $\rightarrow$  490 and `dimensionsToArea("8x10")`  $\rightarrow$  80.
15. Write a method named `appearsBefore`. It accepts as parameters a `String`, a first `char`, and a second `char`. It returns `true` if and only if the first `char` appears in the `String` before the earliest occurrence of the second.