

Use this page for scratch work. **Work written here will not be assessed.**

Question 1**[6 marks]**

Consider a method whose definition is the following:

```
static String testmethod(int n)
{
    String r = "none";

    switch (n)
    {
        case 1: r = "one";
        case 2: r = "two";
        case 3: r = "three";
    }

    return r;
}
```

What string is returned by each of the following calls?

(a) `testmethod(1)`

(b) `testmethod(2)`

(c) `testmethod(8)`

Use this page for scratch work. **Work written here will not be assessed.**

Use this page for scratch work. **Work written here will not be assessed.**

Use this page for scratch work. **Work written here will not be assessed.**

Question 4**[3 marks]**

What will this code fragment print?

```
int x=3, y=0;
while (x>=0) {
    y++;
    x--;
}
System.out.println(y);
```


Question 5**[3 marks]**

What will this code fragment print?

```
int[] a = {1,1,2};
int sum = 0;
for (int i=1; i<=3; ++i) {
    sum += a[i];
}
System.out.println(sum);
```


Use this page for scratch work. **Work written here will not be assessed.**

Use this page for scratch work. **Work written here will not be assessed.**

Use this page for scratch work. **Work written here will not be assessed.**

Use this page for scratch work. **Work written here will not be assessed.**

Question 9**[15 marks]**

Write two classes, `Position` and `Displacement`. A `Position` represents a Cartesian (x, y) position pair, and a `Displacement` represents a Cartesian distance, that is, a $(\delta x, \delta y)$ pair. Ensure that both classes are **immutable**. In both cases, values should be represented as `doubles`.

These classes should implement the following operations:

- Construct new `Position` and `Displacement` objects;
- Subtract one `Position` from another to get a `Displacement`;
- Add a `Displacement` to a `Position` to get a `Position`;
- Add two `Displacements` to get a `Displacement`;
- Scale (multiply) a `Displacement` by a scalar (`double`);
- Get the `x` and `y` components of both `Positions` and `Displacements`.

Please write your answer on pages 10–16.

Use this page for scratch work. **Work written here will not be assessed.**

Answer to Question 9

Use this page for scratch work. **Work written here will not be assessed.**

Answer to Question 9 (continued)

Use this page for scratch work. **Work written here will not be assessed.**

Answer to Question 9 (continued)

Use this page for scratch work. **Work written here will not be assessed.**

Answer to Question 9 (continued)

Use this page for scratch work. **Work written here will not be assessed.**

Overflow Answer Page 1

You may use this space to continue any answer, but if you do, indicate *clearly* in your previous answer that you have continued onto this page, or this part of your answer may be overlooked.

Use this page for scratch work. **Work written here will not be assessed.**

Overflow Answer Page 2

You may use this space to continue any answer, but if you do, indicate *clearly* in your previous answer that you have continued onto this page, or this part of your answer may be overlooked.

