Coding in Java

Consider this UML class diagram.

In this exercise, Shape shall be defined as an abstract class, which contains:

- Two protected instance variables color(String) and filled(boolean). The protected variables can be accessed by its subclasses and classes in the same package. They are denoted with a '#' sign in the class diagram.
- Getter and setter for all the instance variables, and toString().
- Two abstract methods `getArea()` and `getPerimeter()` (shown in italics in the class diagram).

The subclasses Circle and Rectangle shall **override** the abstract methods `getArea()` and `getPerimeter()` and provide the proper implementation. They also **override** the `toString()`.

Write a test class to test these statements involving polymorphism and explain the outputs. Some statements may trigger compilation errors. Explain the errors, if any.

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