The design tries to maximize the amount of code reuse. Each class should utilize the inherited methods to limit the amount of code in each class.

```java
public interface Polygon extends Comparable<Polygon> {
    /**
     * Returns the number of sides of the polygon.
     * @return The number of sides of the polygon.
     */
    public int numberOfSides();

    /**
     * Returns the perimeter of the polygon.
     * @return The perimeter of the polygon.
     */
    public float perimeter();

    /**
     * Calculates the area of the polygon.
     * @return The area of the polygon.
     */
    public float area();
}
```
Triangle
You can utilize Heron’s Formula to calculate the area from the length of the three sides:

\[ A = \sqrt{s(s-a)(s-b)(s-c)} \]

Where \( s \) is half the triangles perimeter.

\[ s = \frac{a + b + c}{2} \]

Quadrilateral
This is an abstract class that has a concrete method for the `numberOfSides()`, but the other methods are declared abstract.

Rectangle
This is a subclass of Quadrilateral and must implement all of the inherited abstract methods.

Square
This is a subclass of Rectangle and will have a different constructor.

Trapezoid
This is a subclass of Quadrilateral and must implement all of the inherited abstract methods.

Remember the area is calculated by the average of the two bases multiplied by the height.