Handout 4: Shapely Polygons - Answers

1. A rectangle has the same number of parallel lines as any other quadrilateral. Is this true or false?
   False. Rectangles always have 2 sets of parallel lines, but generic quadrilaterals aren't required to have any.

2. A pentagon can have a maximum of 4 right angles. Is this true or false?
   False. Pentagons can have a maximum of only 3 right angles.

3. A polygon is made of at least three line segments. Is this true or false?
   True.

4. How many sets of parallel lines must an octagon have?
   None. It can have a maximum of 4 pairs of parallel lines, but a minimum of 0.

5. How many parallel and perpendicular lines must a trapezoid have?
   A trapezoid must have at least 1 set of parallel lines. While no perpendicular lines are necessary in a trapezoid, some have two right angles (the two parallel lines cut by a perpendicular transversal).

6. What is the sum of all the interior angles of a hexagon?
   720°

7. What is the sum of all the interior angles of a polygon with 15 sides?
   2340°

8. What is the measure of each angle in a regular nonagon (9 sides)?
   140°

9. A triangle has points at $(3, 1)$, $(4, 6)$, and $(-2, 2)$. How many parallel and perpendicular lines does this triangle have?
   There are no parallel lines, but the lines from $(3, 1)$ to $(4, 6)$ and from $(3, 1)$ to $(-2, 2)$ are perpendicular.

10. A quadrilateral has points at $(4, -1), (1, 3), (5, 6)$, and $(9, 6)$. How many parallel and perpendicular lines does this quadrilateral have? (Bonus points: What is the name of this quadrilateral?)
    The lines from $(1, 3)$ to $(5, 6)$ and from $(4, -1)$ to $(9, 6)$ are parallel to each other. The line from $(1, 3)$ to $(4, -1)$ is perpendicular to both of these lines. (It's a right trapezoid.)
