KEY

Determine if the statement is ALWAYS or SOMETIMES or NEVER true.

1. **Always** - parallelograms are a subset of quadrilaterals, so every parallelogram must be a quadrilateral.

2. **Never** - parallelograms and trapezoids are mutually exclusive, so one can never be the other.

3. **Always** - this is a property of parallelograms, so it must always be true.

4. **Sometimes** - this is a rectangle property, so it is only true when the parallelogram is a rectangle.

5. **Never** - any four sided polygon only has two diagonals. For example, ABCD has three lengths that come out of point A: AB, AC, and AD. Since AB and AD are sides to the quadrilateral, the only one that is a diagonal is AC. So, when you draw a line segment from each point to every other point in a quadrilateral, you will always get four sides and two diagonals.

6. **Always** - take $ABCD$. Since it is a parallelogram we know that $AB = CD$ and $BC = AD$. These are two corresponding sides of $\triangle ABC$ and $\triangle DAC$. Since the remaining side for both sides is AC, the two triangles have to be congruent by SSS Theorem.

7. **Always** - this is a parallelogram property, so it is always true for a parallelogram.

8. **Sometimes** - this is a rhombus property, so it will only be true for a parallelogram when that figure is also a rhombus.

9. **Never** - consecutive angles of a parallelogram are supplementary (add up to 180°), so they can never be complementary (add up to 90°).

10. **Sometimes** - opposite angles are congruent for every parallelogram, but they can also be supplementary when the angles are 90, which occurs when the figure is a rectangle.

11. **Never** - opposite angles of a parallelogram have to be supplementary (sum to 180°), so they can never be complementary (sum to 90°).

12. **Always** - because this is a parallelogram property.

13. **Always** - because squares are a subset of rhombii.

14. **Sometimes** - squares are a subset of rhombii, so this is true only when the rhombus is also a rectangle.

15. **Sometimes** - squares are a subset of rectangles, so only some rectangles are squares.

16. **Always** - since squares are a subset of rectangles.

17. **Sometimes** - because rectangles are a subset of parallelograms.

18. **Always** - because squares are a subset of parallelograms.

19. **Always** - because rhombii are a subset of parallelograms.

20. **Sometimes** - because the set of rhombii and the set of rectangles are intersecting sets.

21. **Always** - because squares are a subset of paralellograms, and this is a parallelogram property.

22. **Sometimes** - this is a rectangle property, so it is true only for those parallelograms that are a rectangle.

23. **Always** - because this is a rectangle property.

24. **Always** - because this is a rhombus property.

25. **Sometimes** - this is a rhombus property, so it is true only for those rectangles that are also a rhombus.

26. **Sometimes** - in a rhombus, these angles are supplementary. But, they will be congruent in those rhombii that are also a rectangle.

27. **Always** - because it is a rhombus property that all sides are congruent.

28. **Always** - because this is a parallelogram property, and every rectangle is a parallelogram.

29. **Sometimes** - this is a rectangle property, so it will be true for any parallelogram that is a rectangle.