

Always, Sometimes, Never

Use GeoGebra to decide whether the following statements are **always true**, **sometimes true**, or **never true**.

- If a statement is **always true** or **never true**, explain **why**.
- If a statement is sometimes true, describe **when** it is true and explain **why**.

Triangles

1. Right triangles are also isosceles triangles.
2. Right triangles are also equilateral triangles.
3. The longer the base of a triangle is, the larger its area.
4. A triangle is completely determined by measures of two of its angles and the length of the side between them.
5. Any side of a triangle can be used as the base when calculating area.
6. Triangles with the same area have the same perimeter.
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8. Joining all the midpoints of the sides of a triangle creates four smaller triangles which are congruent to each other.
9. The segment connecting a vertex of a triangle with the midpoint of its corresponding side is the bisector of one of the angles of the triangle.
10. The intersection of the altitudes of a triangle are always inside the triangle.
11. The intersection of all three angle bisectors of a triangle are always inside a triangle.

Lines

1. As the slope of a line gets larger, the line gets steeper.
2. As the y-intercept of a line get larger, the line moves upward.
3. Any two distinct lines will intersect once.

Other Polygons

1. Any four-sided figure is a rectangle.
2. Any shape with four equal sides is a square.
3. The diagonals of a square are perpendicular.
4. The diagonals of a rectangle are perpendicular.
5. All pentagons with 5 equal sides have 5 congruent angles.
6. The sum of the internal angles of any hexagon is 720 degrees.

Circles

1. Circles with the same radius are congruent.
2. A circle can be drawn through any three points.