

Triangles and Quadrilaterals

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The area of a Jordan curve is the area of the region bounded by the Jordan curve.

- Definition 01. A simple curve is one that does not intersect itself.
- Definition 02. A closed curve is one that always comes back to its starting point, no matter where you start.
- Definition 03. A planar curve is one that lies entirely in one plane.
- Definition 04. A Jordan curve is a simple closed planar curve.
- Definition 05. If a Jordan curve has finite length, then its perimeter is its length.
- Definition 06. A polygon is a Jordan curve made up of finitely-many straight line segments.
- Definition 07. A side of a polygon is one of the straight line segments that comprise it.
- Definition 08. An n-gon is a polygon having exactly n sides, where n is an integer ≥ 3 .
- Definition 09. A regular polygon is a polygon all of whose sides have equal length, and all of whose angles have equal size.
- Definition 10. A triangle is a 3-gon.
- Definition 11 (meta): The base of a triangle is any of its 3 sides temporarily chosen to have that designation. The altitude of the triangle is then the line segment from the vertex opposite the base to the base that is perpendicular to the base.
- Synapse 01. The area of a triangle is equal to half the product of its base and height.
- Definition 12. An isosceles triangle is one in which at least two sides have equal length.
- Definition 13. A right triangle is a triangle one of whose interior angles is exactly 90 degrees.
- Definition 14. An obtuse triangle is one of whose interior angles is greater than 90 degrees.
- Definition 15. An equilateral triangle is one all of whose sides have equal length.
- Definition 16. An equiangular triangle is one all of whose interior angles have equal size.
- Synapse 02. A triangle is equiangular if it is equiangular.
- Definition 17 (meta): A scalene triangle is one for which the lengths of at least two of its sides are not deducible from the information given.
- Definition 18. A quadrilateral is a 4-gon.
- Definition 19. A parallelogram is a quadrilateral such that the members of both pairs of opposite sides are parallel.
- Definition 20. A rhombus (also called a diamond) is a parallelogram all of whose sides have equal length.
- Definition 21. A rectangle is a parallelogram all of whose interior angles are 90 degrees.
- Definition 22. The length of a side of minimum length of a given rectangle is said to be the width of the rectangle, and the length of a side of maximum length of a given rectangle is said to be the length of the rectangle.
- Definition 23. The aspect ratio of a rectangle is the ratio of its length to its width.
- Definition 24. A rectangle is said to have a metric aspect ratio if each of the two pieces that result when the rectangle is cut in half widthwise have the same aspect ratio as the original rectangle.
- Synapse 03. A rectangle has a metric aspect ratio if its aspect ratio is the square root of 2.
- Definition 25. A rectangle is said to have the golden ratio if the ratio of its width to its length is equal to the ratio of its length to the sum of its width and length.
- Definition 26. A square is a rectangle all of whose sides have equal length.
- Definition 27. A trapezoid is a quadrilateral having two opposite sides parallel.
- Definition 28. An isosceles trapezoid is a quadrilateral such that one pair of opposite sides are parallel, and the other pair of opposite sides are of equal length.

$$\frac{n(n-3)}{2}$$

diagonal

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Synapse 04 (meta). Every triangle is half a parallelogram.

Definition 29. A kite is a parallelogram having 2 pairs of adjacent sides such that the members of each pair have the same length.

Definition 30. A convex region of the plane is a subset M of the plane such that for all points P and Q in M , the line segment joining P and Q is a subset of M .

Synapse 05: Every triangle is convex.

Definition 31. An arrowhead (also called a dart) is a non-convex quadrilateral.

Synapse 06: Every triangle can be inscribed in a circle.

Definition 32. A cyclic quadrilateral is a quadrilateral that can be inscribed in a circle.

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