

# Quadrilateral study guide answers

When you see a table or a towel, the basic quadrangular shapes that come to mind are a rectangle or a square. There are many varieties of quadrilaterals, and the types of quadrilaterals can be determined by the shape of the quadrilaterals themselves. The word is made up of two Latin words: Quadri, a variant of four, and Latus, meaning sides, as its name suggests.

**QUADRILATERALS GRAPHIC ORGANIZER**

With All the Properties, You Can't Miss One!

**QUADRILATERAL CHARACTERISTICS**

All quadrilaterals have these properties in common: 4 sides, 4 vertices, 4 interior angles.

picture	name	sides	angles	diagonals
	PARALLELOGRAM	• opposite sides parallel • opposite sides congruent	• opposite angles congruent • consecutive angles supplementary	• bisect each other
	RECTANGLE	• opposite sides parallel • opposite sides congruent	• all right angles	• bisect each other
	RHOMBUS	• all sides congruent	• opposite angles congruent • consecutive angles supplementary	• perpendicular bisectors
	SQUARE	• all sides congruent	• all right angles	• perpendicular bisectors • diagonals are congruent
	TRAPEZOID	• one pair parallel sides		
	ISOSCELES TRAPEZOID	• one pair parallel sides	• consecutive base angles congruent • opposite base angles supplementary	• congruent diagonals
	KITE	• two pairs of adjacent sides congruent	• pair opposite angles supplementary	• perpendicular diagonals • one diagonal bisects the other

**QUADRILATERAL CHARACTERISTICS**

All quadrilaterals have these properties in common: 4 sides, 4 vertices, 4 interior angles.

picture	name	sides	angles	diagonals

It must have two diagonals.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Special Quadrilaterals** Math 2

What do we know about convex quadrilaterals in fact?

- four sides
- four angles
- the angles sum to 360°
- not all convex quadrilaterals have diagonals that will be in the interior of the quadrilateral.

What if we start specifying things? We have convex quadrilaterals that are defined by the specific information we know about them. They all have special names and the specific information makes us can prove additional properties about them.

For example, if one (and only one) pair of sides are parallel, do we know more about the sides, angles, diagonals?

**1. Pair of Parallel Sides (trapezoid)**

We just proved that consecutive angles between parallel lines are supplementary so the angles on the same leg (C and D, A and B) are supplementary. We can't determine anything else about the sides or the diagonals.

You will complete the exploration given various pieces of information about the special quadrilaterals. Using the theorems and postulates that we have studied so far, consider if the sides are only parallel perpendicular, if the angles are equal/consecutive supplementary, and if the diagonals are equal/perpendicular/bisect each other/intersect at right angles. As you go along, fill in what you know, prove in the table on the last page.

Properties of a quadrilateral. [jipowecajuyoju](#) The properties of a quadrilateral make it different from a regular polygon for several reasons. Here are some general properties of a quadrilateral: it must have four sides. It must have four vertices. It must have two diagonals.  $360^\circ$  is the total sum of the interior angles of the quadrilateral forces. There are different types of quadrilaterals depending on their different unique properties and forms.

QUADRILATERAL Theorems		
Name	Definition	Visual Cue
Theorem	If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.	
Theorem	If one pair of consecutive sides of a parallelogram are congruent, then the parallelogram is a rhombus.	
Theorem	If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rhombus.	
Theorem	If one diagonal of a parallelogram bisects a pair of opposite angles, then the parallelogram is a rhombus.	
Theorem	If a quadrilateral is a kite then its diagonals are perpendicular.	
Theorem	If a quadrilateral is a kite then exactly one pair of opposite angles are congruent.	
Theorem	If a quadrilateral is an isosceles trapezoid, then each pair of base angles are congruent.	
Theorem	If a trapezoid has one pair of congruent base angles, then the trapezoid is isosceles.	
Theorem	A trapezoid is isosceles if and only if its diagonals are congruent.	
Trapezoid Midsegment Theorem	The midsegment of a trapezoid is parallel to each base, and its length is one half the sum of the lengths of the bases.	

© 2011 A.T. Secondary Math Model

A quadrilateral is a two-dimensional polygon with four sides. Quadrilaterals include the following two-dimensional figures: square, rectangle, diamond, trapezoid, parallelogram, and kite. A quadrilateral definition of a quadrilateral is a quadrilateral and is a polygon composed of four sides, four vertices, four corners, and two diagonals. Properties of a quadrilateral. The properties of a quadrilateral make it different from a regular polygon for several reasons. Here are some general properties of a quadrilateral: it must have four sides. It must have four vertices. It must have two diagonals.  $360^\circ$  is the total sum of the interior angles of the quadrilateral forces.

**SCOPE**

**Quadrilaterals**

HS Geometry  
Mathematics  
Unit 11  
Lesson 01  
Duration: 7 days

**Lesson Synopsis:**  
In this lesson students explore properties of quadrilaterals in a variety of ways including concrete modeling, paper folding, measurement, and coordinate geometry. The explorations lead to discovery of the various properties of quadrilaterals that naturally group quadrilaterals according to the number of pairs of parallel sides. Students use properties to not only solve quadrilateral problems but justify basic properties of quadrilaterals using logic and coordinate geometry. Students reveal quadrilateral groupings as they create a structure that illustrates the lineage of quadrilaterals.

**TEKS:**

- G.2 Geometric structure The student analyzes geometric relationships in order to make and verify conjectures.
- G.2B Make conjectures about angles, lines, polygons, circles, and three-dimensional figures and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic.
- G.3 Geometric patterns The student uses a variety of representations to describe geometric relationships and solve problems.
- G.5B Use numeric and geometric patterns to make generalizations about geometric properties, including properties of polygons, ratios in similar figures and solids, and angle relationships in polygons and circles.
- G.7 Dimensionality and the geometry of location The student understands that coordinate systems provide convenient and efficient ways of representing geometric figures and uses them accordingly.
- G.7B Use slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons.
- G.7C Derive and use formulas involving length, slope, and midpoint.

---

**GETTING READY FOR INSTRUCTION**

**Performance Indicator(s):**

- Investigate, compare, identify, and apply properties of quadrilaterals, including the trapezoid, kite, trapezoid, parallelogram, rhombus, rectangle, and square in order to create a family tree of quadrilaterals and identify quadrilaterals by applying characteristics with coordinate proofs. (G2.B, G5.B, G.7B.C)

**Key Understandings and Guiding Questions:**

- Different types of quadrilaterals have specific characteristics and properties.
  - What characteristics are used to identify types of quadrilaterals?
  - What are the specific properties for each type of quadrilateral?
  - What characteristic differentiates between a trapezoid, a trapezoid, and a parallelogram?
  - How do a rhombus, rectangle, or square relate to a parallelogram?
- Quadrilaterals can be identified by applying characteristics with coordinate proofs.
  - What characteristics of a square must be analyzed in a coordinate proof?
  - How can the slope, midpoint, and distance formulas be used to analyze quadrilaterals with coordinate geometry?

**Vocabulary of Instruction:**

• trapezoid	• rhombus	• consecutive sides
• kite	• rectangle	• opposite sides
• rhombus	• square	
• isosceles trapezoid	• consecutive angles	
• parallelogram	• opposite angles	

© 2011 TECCO      Revised 10/2017      page 1 of 50

A quadrilateral is a two-dimensional polygon with four sides. [mojayule](#) Quadrilaterals include the following two-dimensional figures: square, rectangle, diamond, trapezoid, parallelogram, and kite. A quadrilateral definition of a quadrilateral is a quadrilateral and is a polygon composed of four sides, four vertices, four corners, and two diagonals. Properties of a quadrilateral. The properties of a quadrilateral make it different from a regular polygon for several reasons. Here are some general properties of a quadrilateral: it must have four sides. It must have four vertices. It must have two diagonals.  $360^\circ$  is the total sum of the interior angles of the quadrilateral forces. There are different types of quadrilaterals depending on their different unique properties and forms. We will simply look at the quadrilateral shapes, you can understand their differences and their characteristics. In this section, let's briefly discuss certain types of quadrilaterals. Square: A quadrilateral with four sides and equal angles is called a square. The fact is that its sides and angles are equal, so it is a regular quadrilateral. A square has four  $90^\circ$  angles. It can also be thought of

as a rectangle with two adjacent sides of equal length. Squares:  $a = b = c = d$  diagonals:  $ac = bd$  Angles:  $\angle A = \angle B = \angle C = \angle D = 90^\circ$  If a side of a square is "A", then the area of a square is  $A^2$  the perimeter of the square is  $4a$ . Rectangle: a rectangle in four years' time as we see a counter or a handkerchief, the main quadrilateral shapes of  $2 \times 4$ , rectangular or square  $2 \times 4$ . sezafuca There are many types of quadrilaterals and quadrangular shapes reveal the types of quadrangles. The word is composed of two Latin words: quadri (variant of four words) and Latus (sides), as its name suggests. A quadrilateral is a two-dimensional polygon with four sides. The quadriceps consist of the following two-dimensional figures: square, rectangular, diamonds, trapezoid, parallel and deer. The quadrilateral definition of quadrilaterals in the quadrilateral is the shape of a polygon composed of four sides, four summits, four angles and two diagonals. Quadrangled properties. The properties of the quadrilateral distinguish it from the normal polygon for several reasons.

Quadrilateral Classification Chart

Shape	Characteristics	Name
	No parallel sides	Trapezium
	Exactly one pair of parallel sides	Trapezoid
	Two pairs of parallel sides	Parallelogram
	Parallelogram with congruent sides	Rhombus
	Parallelogram with right angles	Rectangle
	Rectangle with congruent sides	Square

Note: that squares, rectangles, and rhombuses are types of parallelograms and that a square is a type of rectangle and a type of rhombus.

It must have four vertices. It must have two diagonals.  $360^\circ$  is the total sum of the interior angles of the quadrilateral forces. There are different types of quadrilaterals depending on their different unique properties and forms.

We will simply look at the quadrilateral shapes, you can understand their differences and their characteristics. In this section, let's briefly discuss certain types of quadrilaterals. Square: A quadrilateral with four sides and equal angles is called a square.

The fact is that its sides and angles are equal, so it is a regular quadrilateral. A square has four  $90^\circ$  angles. It can also be thought of as a rectangle with two adjacent sides of equal length. Squares:  $a = b = c = d$  diagonals:  $ac = bd$  Angles:  $\angle A = \angle B = \angle C = \angle D = 90^\circ$  If a side of a square is "A", then the area of a square is  $A^2$  the perimeter of the square is  $4a$ . Rectangle: a rectangle in four years' time as we see a counter or a handkerchief, the main quadrilateral shapes of  $2 \times 4$ , rectangular or square  $2 \times 4$ . There are many types of quadrilaterals and quadrangular shapes reveal the types of quadrangles. The word is composed of two Latin words: quadri (variant of four words) and Latus (sides), as its name suggests. A quadrilateral is a two-dimensional polygon with four sides. The quadriceps consist of the following two-dimensional figures: square, rectangular, diamonds, trapezoid, parallel and deer. The quadrilateral definition of quadrilaterals in the quadrilateral is the shape of a polygon composed of four sides, four summits, four angles and two diagonals. Quadrangled properties. The properties of the quadrilateral distinguish it from the normal polygon for several reasons. Here are some of the current properties of the quadrilaterals: they must have four sides. You should have four peaks. They must have two diagonals.

$360^\circ$  is the total sum of the interior angles. Square shapes say a lot about their properties. Quadrilateral types are available in different types of quadrilaterals based on different unique properties and shapes. By simply looking at the square shapes, you can see their differences and their features. In this section, we briefly discuss certain types of quadrangles. Square: a quadrilateral with four sides and identical angles is called a square. The fact is that its sides and corners are smooth, so it is a correct quadrilateral. The square has four angles of  $90^\circ$ . Alternatively, it can be considered a rectangle with two adjacent edges of the same length. Square edges:  $AB = BC = CD = DA$  Diagonals:  $ac = bd$  Angles:  $\angle A = \angle B = \angle C = \angle D = 90^\circ$  If the square is "a", the area of the square is equal to  $a^2$  square perimeter is  $4a$ . Kite: As the name suggests, Parallel is a simple quadrilateral whose opposite sides are parallel. Therefore, it consists of two sets of parallel parts. Opposite corners are considered parallel. Parallel diagonals also stop. The sum of two adjacent corners is  $180^\circ$ . woxipurisesufa Parallel sides:  $a = b = c = d$  Diagonals:  $ac = bd$  Angles:  $\angle A = \angle B = \angle C = \angle D = 90^\circ$  If the duration of the parallel is, width is  $b$  and height is  $h$ , then the circumference of the parallel is equal to  $2(a + b)$ . The parallel surface is the same as  $a \times h$  diamond: A quadrilateral, also called a diamond, has four equal sides that are not parallel.

The corners are not exactly  $90$  degrees. The right angle turns the diamond into a square. A diamond is sometimes referred to as a "diamond" due to its similarity to the diamond card of playing cards. Side to edge:  $a = b = c = d$  Diagonals:  $ac = bd$  Angles:  $\angle A = \angle B = \angle C = \angle D = 90^\circ$  Diamond has a circumference equal to  $4a$  if its side is  $a$ . Same  $\frac{1}{2} \times D \times H$  Trapezoid: A pair of parallel sides consists of a quadrilateral called a trapezoid. The other two sides are called "legs" or "sides," while the parallel sides are called "bases." Trapezoid, as shown in the figure above, if the trapezoid height is "H", then the trapezoid circumference = the total length of all sides, so  $AB + BC + CD + de$ . The trapezoidal area is the same as  $\frac{1}{2} \times (AB + CD) \times H$  square solved problem Q1. Find the parallel base if its area is  $144$  square units and the height is  $6$ . Answer:  $144 = \frac{1}{2} \times (a + b) \times 6$  parallel  $S$ ; Area =  $144$  square units =  $6 \times 100^\circ$   $abcd$  is a cyclic square:  $80^\circ$  We summarize what we have learned in this article. A square is a polygon with four sides and four corners, like a square, parallel to it, rectangle, trapezoid, kite or rumble.

Depending on the different characteristics and shapes, there are different types of squares. The above article briefly discusses the properties of area, namely square, parallel of this diamond and trapezoid. Try asking specific practice questions to gain a better understanding of the quadratic topic. fesanicesi Square.