

Parallelograms:

- Both pair of opp sides parallel
- Both pair of opp sides congruent
- Both pair of opp angles congruent
- Consecutive angles supplementary
- Diagonals bisect each other.

You can use any of the above to prove a quadrilateral is a Parallelogram PLUS:

If one pair of opp sides is both parallel and congruent.

Rhombus:

- All sides are congruent.
- Diagonals bisect each other AND are perpendicular
- Each diagonal bisects two angles of the Rhombus.

To prove a quadrilateral is a Rhombus you can use any of the above.

Rectangle:

- All angles are right angles
- Diagonals bisect each other and are congruent.

You can use either of the above to prove a quadrilateral is a rectangle.

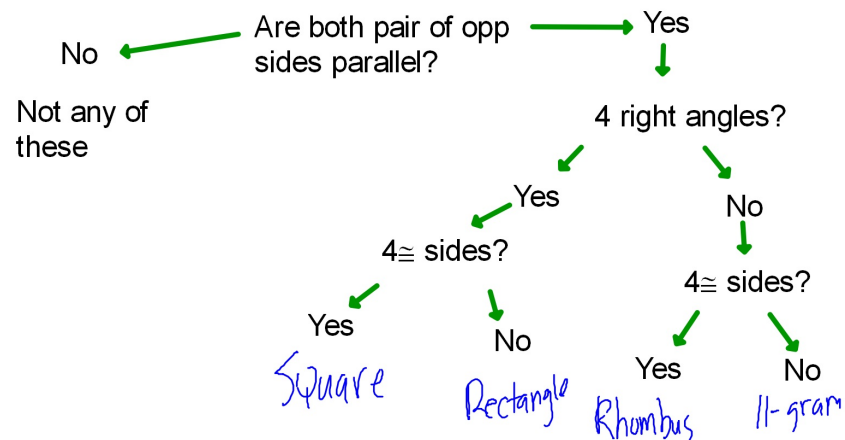
Square: Combination of a Rhombus and a Rectangle.

- All sides are congruent AND all angles are right angles.
- Diagonals bisect each other AND are perpendicular AND are congruent
- Each diagonal bisects two angles of the Square.

To prove a quadrilateral is a Square you can use any of the above.

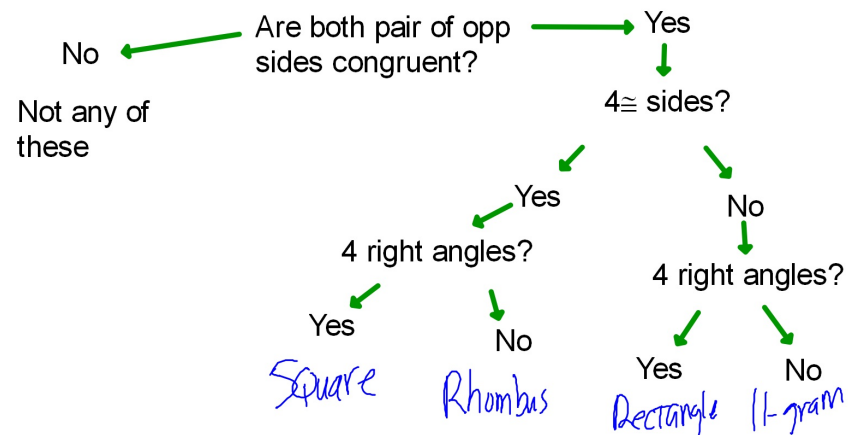
Parallelogram, Rhombus, Rectangle, or Square?

Sides \rightarrow slope



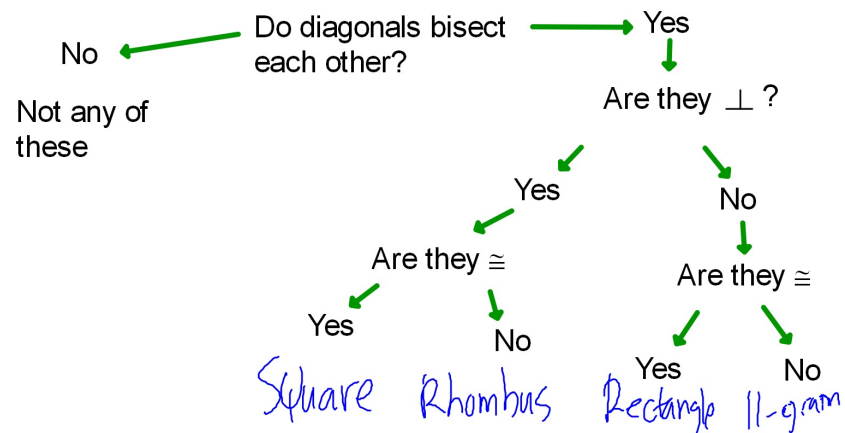
Parallelogram, Rhombus, Rectangle, or Square?

Sides \rightarrow distance



Parallelogram, Rhombus, Rectangle, or Square?

Diagonals



After each statement tell which of the figure(s) it is a characteristic of:

Parallelogram(P), Rhombus(Rh), Rectangle(Rec), Square(S)

- | | |
|---------------------------------|----------------------------------|
| 1. All sides are congruent. | 2. Opposite Sides are \cong . |
| Rh, S | P, Rh, Rec, S |
| 3. Opposite sides are parallel. | 4. Opposite Angles are \cong . |
| P, Rh, Rec, S | P, Rh, Rec, S |
| 5. All angles are Rt. angles. | 6. Consec angles are suppl |
| S, Rec | P, Rh, Rec, S |

After each statement tell which of the figure(s) it is a characteristic of:
 Parallelogram(P), Rhombus(Rh), Rectangle(Rec), Square(S)

- | | |
|---------------------------------|--|
| 7. Diagonals bisect each other. | 8. Diagonals are \cong |
| P, Rh, Rec, S | S, Rec |
| 9. Diagonals are perpendicular. | 10. Each diagonal bisects opposite angles. |
| S, Rh | Rh, S |

What is the best name for Quadrilateral JKLM?

Rectangle

J(-4, 7) K(-8, 1) L(1, -5) M(5, 1)

Diagonals BISECT NOT \perp

midpoint
 JL $(-1.5, 1)$
 KM $(1.5, 1)$

slope
 $\frac{7-5}{-4-1} = \frac{12}{-5}$
 $\frac{-1-1}{5-8} = \frac{2}{13}$

DISTANCE
 $\sqrt{12^2 + 5^2} = \sqrt{169}$
 $\sqrt{10^2 + 13^2} = \sqrt{169}$

What is the best name for Quadrilateral STUV?

Square

S(-3, 1) T(7, 7) U(13, -3) V(3, -9)

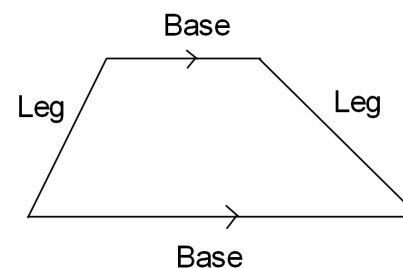
Slope distance

ST $\frac{6}{10}$ $\sqrt{10^2 + 6^2} = \sqrt{136}$
 TU $-\frac{10}{6}$ $\sqrt{136}$
 UV $\frac{6}{10}$ $\sqrt{136}$
 VS $-\frac{10}{6}$ $\sqrt{136}$

Opposite sides are parallel
 There is four right angles
 All sides are congruent

Sec 6-5: Trapezoids and Kites.

Trapezoid: exactly one pair of sides is parallel



Bases: the parallel sides
 Legs: The non-parallel sides

Angles inside the Trapezoid are called the Base Angles.