

key

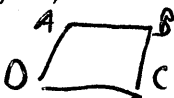
True/False. If the statement is false, rewrite it to make it true.

1. Every quadrilateral is a parallelogram

F

2. If quadrilateral ABCD is a parallelogram, then $AB = CD$.

True



3. If both pairs of opposite angles in a quadrilateral are congruent, then the quadrilateral is a parallelogram.

True

4. If MNOP is a rectangle, then it is a parallelogram.

True

5. You can prove that a quadrilateral is a rectangle by proving that the diagonals are congruent.

True

6. If a quadrilateral is a rhombus or a square, then the diagonals are perpendicular.

True

7. A square has all the properties of a parallelogram, a rectangle, a rhombus, and a trapezoid.

True

8. If a quadrilateral has four right angles, then it must be a rectangle. or square

True

9. The bases of an isosceles trapezoid are congruent.

True

10. The median of a trapezoid is parallel to the bases of the trapezoid and its measure is half the sum of the measures of the bases.

True

11. A kite has exactly ~~one~~ ^{two} pair of congruent sides.

False

12. The diagonals of a ^{isosceles} trapezoid are congruent.

False

13. Opposite angles of a rhombus are ~~never~~ ^{always} supplementary or congruent.

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14. In a kite, there is one pair of congruent angles.

True

15. Consecutive angles are ~~never~~ ^{opposite} supplementary in a trapezoid.

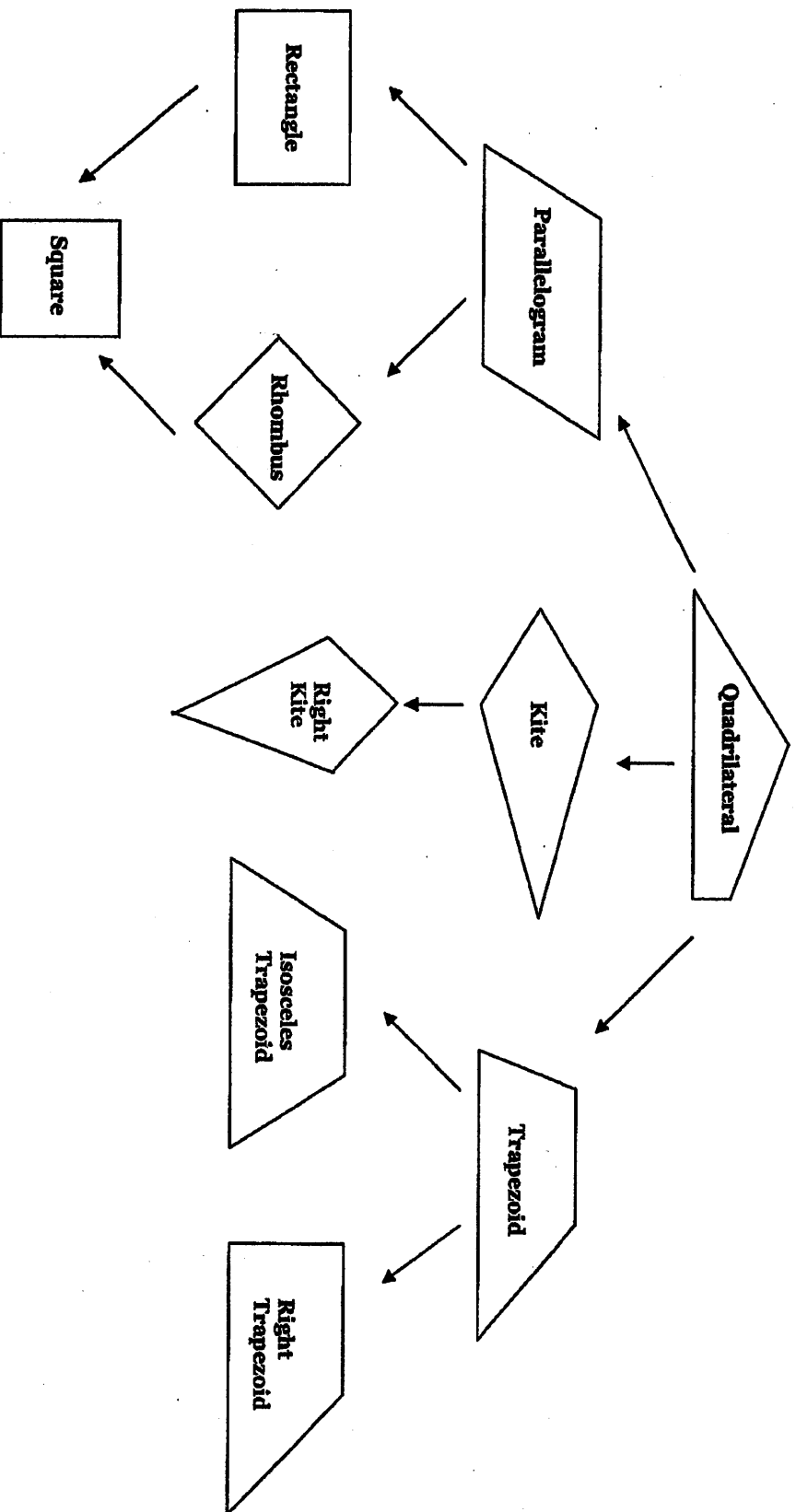
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congruent

Properties of Quadrilaterals

Model Examples

Goal: The goal is to know and apply the properties of quadrilaterals.



Quadrilateral
1. A polygon with four sides.

Parallelogram

1. Both pairs of opposite sides are parallel.
2. Both pairs of opposite sides are congruent.
3. One pair of opposite sides are parallel and congruent.
4. Diagonals bisect each other.
5. Both pairs of opposite angles are congruent.
6. Consecutive angles are supplementary.

Rectangle

1. All the properties of a parallelogram.
2. Has a right angle.
3. Diagonals are congruent.

Rhombus

1. All the properties of a parallelogram.
2. All sides are congruent.
3. Diagonals are perpendicular.
4. Diagonals bisect the opposite angles.

Square

1. All the properties of a parallelogram.
2. All the properties of a rectangle.
3. All the properties of a rhombus.

Kite

1. Both pairs of consecutive sides are congruent but opposite sides are not congruent.
2. Diagonals are perpendicular.
3. Exactly one pair of opposite angles are congruent.

Right Kite

1. All the properties of a kite.
2. Has a right angle.

Trapezoid

1. Exactly one pair of opposite sides are parallel.
2. Exactly two pairs of consecutive angles are supplementary.

Isosceles Trapezoid

1. All the properties of a trapezoid.
2. Non-parallel sides are congruent.
3. Diagonals are congruent.
4. Base angles are congruent.

Right Trapezoid

1. All the properties of a trapezoid.
2. Has a right angle.

Review Topics: Distance, Midpoint, Perimeter and Area, Angles of Polygons

Formulas:	Distance: $d^2 = \Delta x^2 + \Delta y^2$ or $d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$	Midpoint: $M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
n is the number of sides	Sum of Interior Angles: $180(n-2)$	Interior angle = $\frac{180(n-2)}{n}$
	Sum of Exterior Angle: 360°	Exterior Angle: $\frac{360}{n}$

Find the possible values for a given the distance between the 2 points:

<p>1. $d = \sqrt{34}$; $(3, 5)$ and $(a, 8)$</p> $d^2 = (a-3)^2 + (8-5)^2$ $\sqrt{34}^2 = (a-3)^2 + 3^2$ $34 = (a-3)^2 + 9$ $25 = (a-3)^2$ $\sqrt{25} = \sqrt{(a-3)^2}$ $\pm 5 = a-3$ $3 \pm 5 = a$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">$a = 8, -2$</div>	<p>2. $d = \sqrt{72}$; $(-4, a)$, $(2, 4)$</p> $\sqrt{72}^2 = (2 - (-4))^2 + (4-a)^2$ $72 = 6^2 + (4-a)^2$ $36 = (4-a)^2$ $\sqrt{36} = \sqrt{(4-a)^2}$ $\pm 6 = 4-a$ $a = 4 \pm 6$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">$a = -2, 10$</div>
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Find the sum of the measures of the interior angles of each convex polygon.

3. Heptagon $n=7$

$$Sum = 180(7-2) = \boxed{900^\circ}$$

The measure of an interior angle of a regular polygon is given. Find the number of sides in the polygon.

4. 150°

$$\frac{150}{1} = \frac{180(n-2)}{n}$$

$$150n = 180(n-2)$$

$$150n = 180n - 360$$

$$-30n = -360$$

$n = 12$

Find the measure of one interior angle of each regular polygon.

5. 14-gon
 $n=14$

$$Angle = \frac{180(14-2)}{14} = \frac{2160}{14} = \boxed{154.286^\circ}$$

Find the measure of one exterior angle of each regular polygon.

6. 24-gon
 $n=24$

$$Angle = \frac{360}{24} = 15^\circ$$

Find the midpoint of the line segment with the given endpoints. $M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

7. $(2, -11)$, $(-8, -6)$

$$M\left(\frac{2-8}{2}, \frac{-11-6}{2}\right)$$

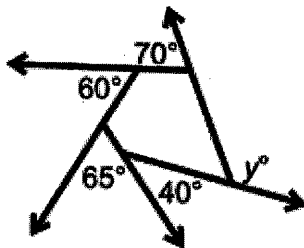
$M(-3, -8.5)$

8. $(4, -5)$, $(-9, -37)$

$$M\left(\frac{4-9}{2}, \frac{-5-37}{2}\right)$$

$M(-5/2, -21)$

9. Find y :



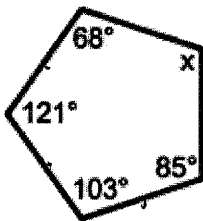
$$\text{Sum} = 360^\circ$$

$$70 + 60 + 65 + 40 + y = 360$$

$$y + 235 = 360$$

$$y = 125^\circ$$

11. find the measure of the missing variable(s).



$$\text{Sum} = 180(5-2) = 540$$

$$68 + 121 + 103 + 85 + x = 540$$

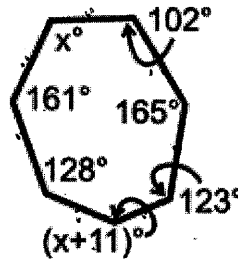
$$x + 377 = 540$$

$$x = 163$$

10. find the measure of the missing variable(s).

$$n = 7$$

$$\text{Sum} = 180(7-2) = 900^\circ$$



$$2x + 11 + 161 + 128 + 165 + 102 + 123$$

$$2x + 690 = 900$$

$$2x = 210$$

$$x = 105$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

12. Endpoint: $(7, -5)$, midpoint: $(-3, 3)$

$$M \left[\begin{array}{cc} 7 & -5 \\ -3 & 3 \end{array} \right] \begin{array}{l} 10 \\ 8 \end{array}$$

$$10 \left[\begin{array}{cc} -13 & -5 \end{array} \right] 8$$

$$\text{Endpoint } (-13, 11)$$

13. Endpoint: $(-4, 5)$, midpoint: $(12, 3)$

$$M \left[\begin{array}{cc} -4 & 5 \\ 12 & 3 \end{array} \right] \begin{array}{l} 16 \\ -2 \end{array}$$

$$16 \left[\begin{array}{cc} 28 & 1 \end{array} \right] -2$$

$$\text{Endpoint } (28, 1)$$

14. Find the Perimeter and Area of the rectangle

$$EF^2 = (3-2)^2 + (7-6)^2 = 1 + 1 = 2$$

$$EF = \sqrt{2}$$

$$FG^2 = (6-3)^2 + (4-7)^2 = 3^2 + 3^2 = 18$$

$$FG = \sqrt{18}$$

$$\text{Perimeter} = \sqrt{2} + \sqrt{2} + \sqrt{18} + \sqrt{18} = 11.314$$

$$\text{Area} = (\sqrt{2})(\sqrt{18}) = \sqrt{36} = 6$$

