Parallelograms
(part 2)

title

20,21

$$\frac{2520°}{180} = \frac{(n-2)180}{180}$$

$$14 = n-2$$

$$16 = n$$

16-gon

Jan 25-8:25 AM

Ways to Prove a Quadrilateral is a Parallelogram

➤ Show both pairs of opposite sides are parallel. Slope

➤ Show both pairs of opposite sides are congruent. Distance

➤ Show both pairs of opposite angles are congruent.

➤ Show one angle is supplementary to both consecutive angles.

➤ Show the diagonals bisect each other.

➤ Show one pair of opposite sides are congruent and parallel.

proving parallelograms

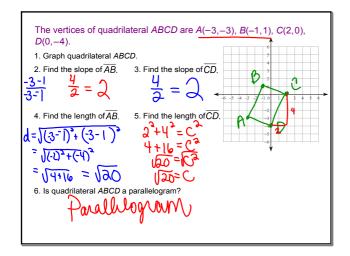### *Using Coordinate Geometry*

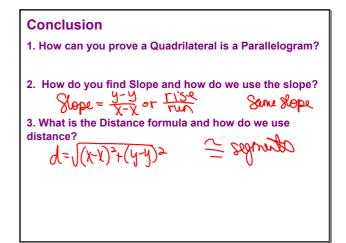➤ Use slope to prove sides are parallel.
(parallel lines have the same slope)

$$Slope = \frac{y-y}{x-x} = \frac{rise}{run}$$

➤ Use the Distance Formula or the Pythagorean Theorem to prove sides are congruent.

$$distance = \sqrt{(x-x)^2 + (y-y)^2}$$

or

Pythagorean Thm $a^2 + b^2 = c^2$

coordinate geometry

The vertices of quadrilateral $ABCD$ are $A(-3,-3)$, $B(-1,1)$, $C(2,0)$, $D(0,-4)$.

1. Graph quadrilateral $ABCD$.

2. Find the slope of $\overline{AB}$.

$$\frac{-3-1}{-3-1} \qquad \frac{4}{2} = 2$$

3. Find the slope of $\overline{CD}$.

$$\frac{4}{2} = 2$$

4. Find the length of $\overline{AB}$.

$$d = \sqrt{(3-1)^2 + (3-1)^2}$$
$$= \sqrt{(-2)^2 + (-4)^2}$$
$$= \sqrt{4+16} = \sqrt{20}$$

5. Find the length of $\overline{CD}$.

$$2^2 + 4^2 = C^2$$
$$4 + 16 = C^2$$
$$\sqrt{20} = \sqrt{C^2}$$
$$\sqrt{20} = C$$

6. Is quadrilateral $ABCD$ a parallelogram?

Parallelogram

example

Conclusion

1. How can you prove a Quadrilateral is a Parallelogram?

2. How do you find Slope and how do we use the slope?

$$Slope = \frac{y-y}{x-x} \text{ or } \frac{rise}{run} \qquad \text{Same slope}$$

3. What is the Distance formula and how do we use distance?

$$d = \sqrt{(x-x)^2 + (y-y)^2} \qquad \cong \text{ segments}$$

Jan 24-6:43 PM

Assignment

Parallelograms #2 Wkst

Jan 24-6:45 PM