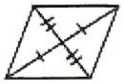
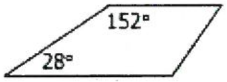
Name: AK Period:_______ Date:________________________

7.3 Proving Quadrilaterals are Parallelograms

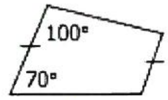
Determine if each quadrilateral is a parallelogram. Explain why or why it does not work.

1)


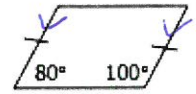
Yes, diags bisect.

2)


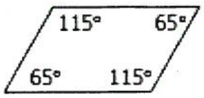
NO

3)


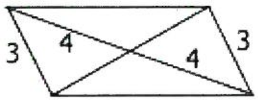
No

4)


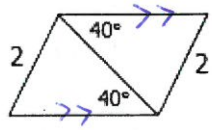
Yes, one pair both ≅ & ∥.

5)


Yes, opp angles are ≅

6)


No

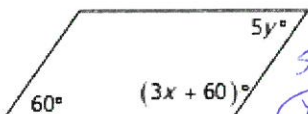
7)


No

8)


Yes, by definition (opp sides are ∥).

Find the value of x and y that ensure each quadrilateral is a parallelogram.

9)


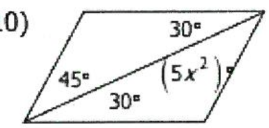
$5y = 60$

$y = 12$

$60 + 3x + 60 = 180$

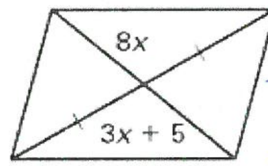
$3x = 60$

$x = 20$

10)


$\frac{45}{5} = \frac{5x^2}{5}$ $x = 3, -3$

$\sqrt{9} = \sqrt{x^2}$

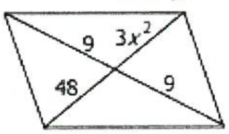
11)


$8x = 3x + 5$

$-3x \quad -3x$

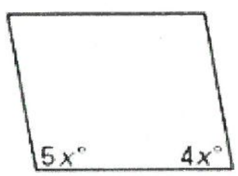
$5x = 5$

$x = 1$

12)


$\frac{48}{3} = \frac{3x^2}{3}$ $x = 4, -4$

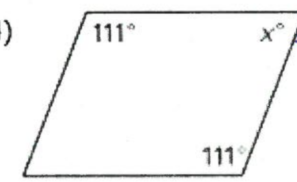
$\sqrt{16} = \sqrt{x^2}$

13)


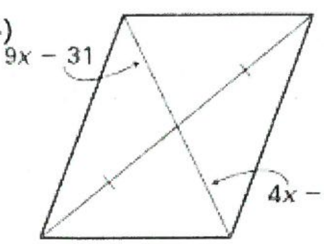
$5x + 4x = 180$

$9x = 180$

$x = 20$

14)


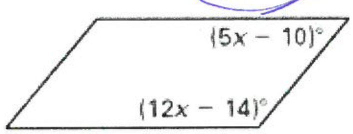
$= 69^0$

15)


$9x - 31 = 4x - 1$

$5x = 30$

$x = 6$

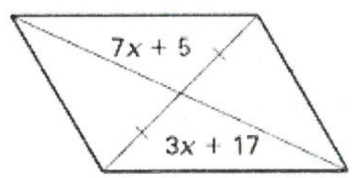
16)


$12x - 14 + 5x - 10 = 180$

$17x - 24 = 180$

$17x = 204$

$x = 12$

17)


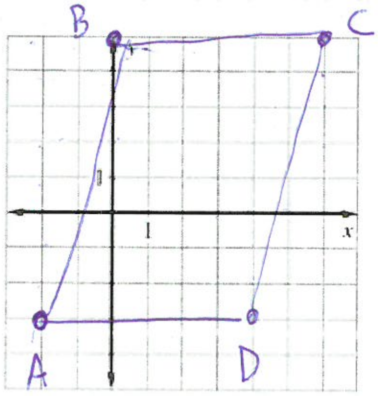
$7x + 5 = 3x + 17$

$4x = 12$

$x = 3$

18) Prove ABCD is a parallelogram using slope.

$A(-2, -3)$, $B(0, 5)$, $C(6, 5)$, $D(4, -3)$



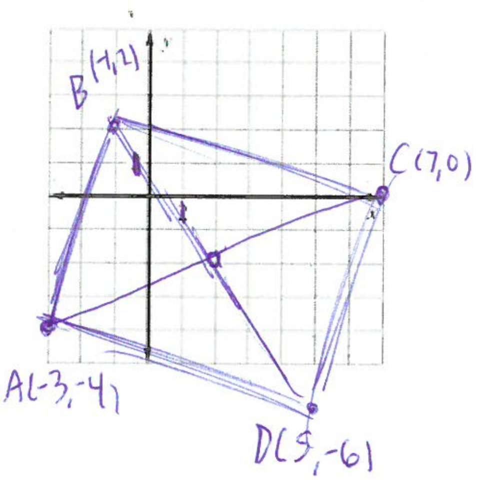
Slope of: BC = 0
AD = 0
AB = 4
CD = 4

AD ∥ BC
AB ∥ CD because they have the same slope

ABCD is a parallelogram.

19) Prove ABCD is a parallelogram using midpoint.

$A(-3, -4)$, $B(-1, 2)$, $C(7, 0)$, $D(5, -6)$



Midpoint of AC (2, -2)

Midpoint of BD (2, -2)

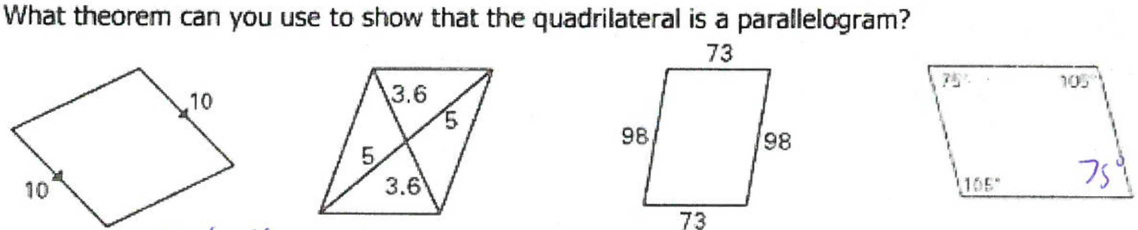
Therefore the diagonals bisect eachother.

ABCD is a parallelogram

20) Could you prove a quadrilateral was a parallelogram using the distance formula or length if you were given the coordinates of the vertices, like in problems 18 and 19? Briefly explain why or why not.

Yes, show opposite sides are congruent

21) What theorem can you use to show that the quadrilateral is a parallelogram?



One pair ∥ & ≅ | Diags bisect | opp sides ≅ | opp angles ≅