# 8.3 Worksheet Proving Parallelograms

Name **Key**

Date _____ Period ____

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

1)

yes, diagnals bisect

2) 152° 28°

No

3) 100° 70°

No

4) 80° 100°
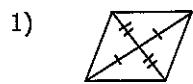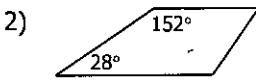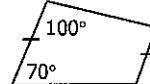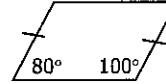
yes, opp sides ≅ consecutive ∠'s = 180

5) 115° 65° 65° 115°

yes, opp ∠'s ≅

6) 3 4 4 3

yes, opp. sides ≅ diagnals bisect

7) 2 40° 40° 2
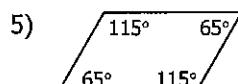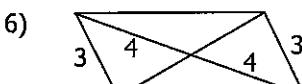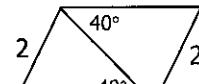
- yes opp. sides
- || lines ≅

8)
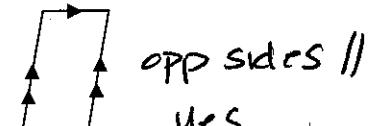
opp sides ||
yes

Find the value of x and y that ensure each quadrilateral is a parallelogram.
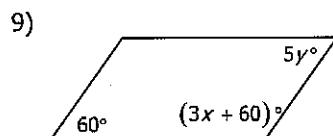
9) $5y°$ $60°$ $(3x + 60)°$

$5y = 60$
$\boxed{y = 12}$

$60 + 3x + 60 = 180$
$120 + 3x = 180$
$\boxed{x = 20}$

10) 30° 45° $(5x^2)°$ 30°

$45 = 5x^2$
$9 = x^2$
$5(3^2)$
$5(9) = 45$
$\boxed{3 = x}$

11) 8x, 3x + 5

$8x = 3x + 5$
$5x = 5$
$\boxed{x = 1}$

12) 9 $3x^2$ 48 9

$48 = 3x^2$
$16 = x^2$
$\boxed{x = 4}$

13) $5x°$ $4x°$

$5x + 4x = 180$
$9x = 180$
$\boxed{x = 20}$

14) 111° $x°$ 111°
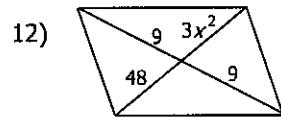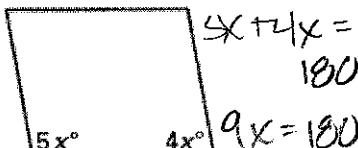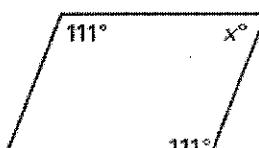
$180 = x + 111$
$\boxed{x = 69°}$

15) $9x - 31$ $4x - 1$
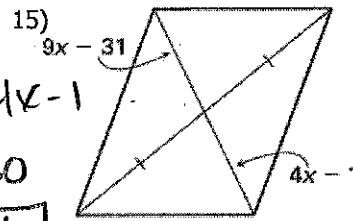
$9x - 31 = 4x - 1$
$5x = 30$
$\boxed{x = 6}$
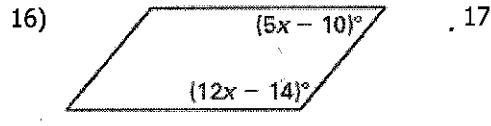
16) $(5x - 10)°$ $(12x - 14)°$

$5x - 10 + 12x - 14 = 180$
$17x - 24 = 180$
$\boxed{x = 12}$

17) $7x + 5$ $3x + 17$
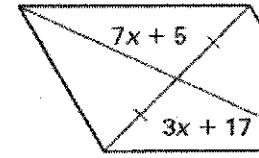
$7x + 5 = 3x + 17$
$4x = 12$
$\boxed{x = 3}$

18) $2x - 1$ $x + 5$
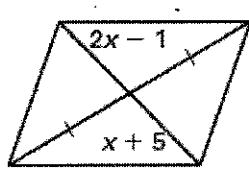
$2x - 1 = x + 5$
$\boxed{x = 6}$
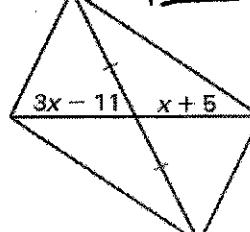
19) $3x - 11$ $x + 5$

$3x - 11 = x + 5$
$2x = 16$
$\boxed{x = 8}$

20) $(5x - 7)°$ $(x + 1)°$
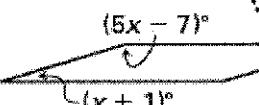
$5x - 7 + x + 1 = 180$
$6x - 6 = 180$
$6x = 186$
$\boxed{x = 31}$

Draw a picture of each quadrilateral, to determine if it is a parallelogram by one of the following reasons. Be able to explain your selection.

a) Opposite sides congruent.
b) Opposite angles congruent.
c) Diagonals bisect each other.
d) One pair of opposite sides is both parallel and congruent.
e) Both pairs of opposite sides are parallel.

21) In quadrilateral BLOT, $\overline{BL} \parallel \overline{TO}$, $m\angle BTO = 80°$, and $m\angle LOT = 100°$

22) In quadrilateral JOKE, $\overline{JO} \cong \overline{EK}$, $m\angle OJE = 65°$, and $m\angle JEK = 115°$.
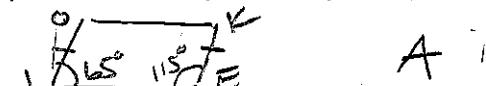
23) In quadrilateral SLOW, $\overline{SL} \cong \overline{LO} \cong \overline{OW} \cong \overline{SW}$.
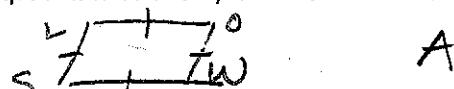
24) In quadrilateral MOAT, $\overline{MA}$ intersects $\overline{OT}$ at R, $\overline{MR} \cong \overline{RA}$, and $\overline{TR} \cong \overline{OR}$.
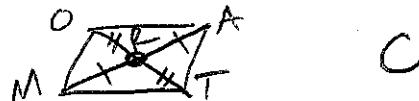
25) In quadrilateral CRAB, $m\angle RCB = 60°$, $m\angle CBA = 120°$, and $m\angle CRA = 120°$.
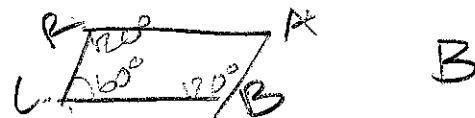
Show that the following figure is a parallelogram.

26) $A(-2, -3)$, $B(0, 5)$, $C(6, 5)$, $D(4, -3)$
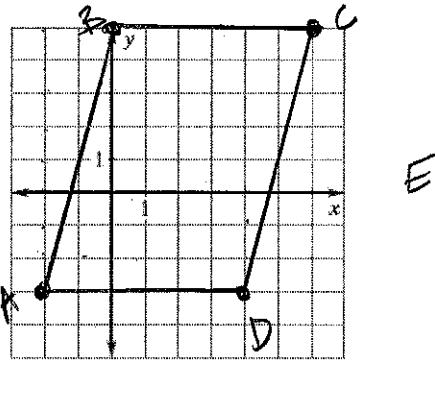
27) $A(-3, -4)$, $B(-1, 2)$, $C(7, 0)$, $D(5, -6)$
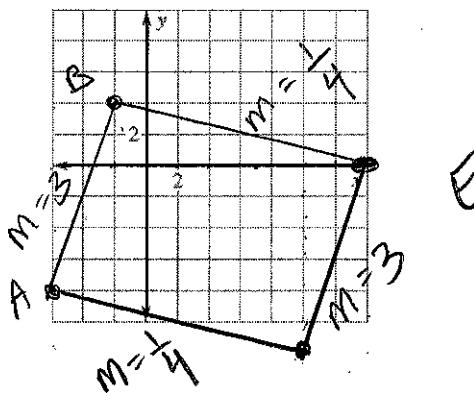
What theorem can you use to show that the quadrilateral is a parallelogram? (See top of page)

28)

29)

30)

31)