Name_____ Date_____

6.3 – Proving Quadrilaterals are Parallelograms

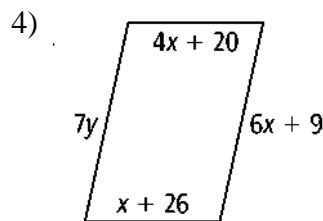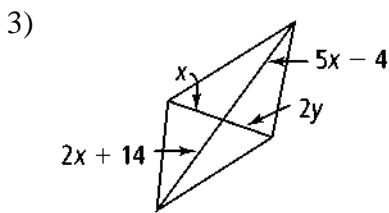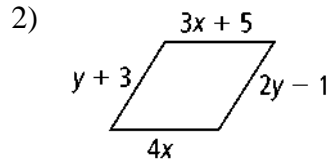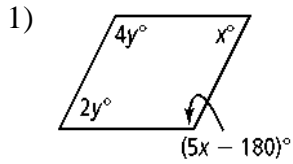For what values of *x* and *y* make the quadrilateral a parallelogram?

1)

$4y°$ $x°$
$2y°$
$(5x − 180)°$

2)

$3x + 5$
$y + 3$ $2y − 1$
$4x$

3)

x $5x − 4$
$2y$
$2x + 14$

4)

$4x + 20$
$7y$ $6x + 9$
$x + 26$

5)

$(12y + 8)°$
$2x°$ $(5y + 2)°$

6)
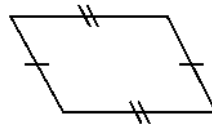
$2y + 2$
$x + 9$
$2x$
$2y$
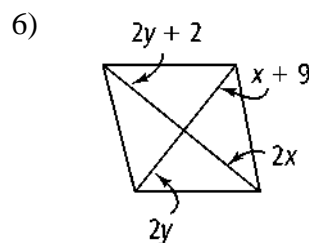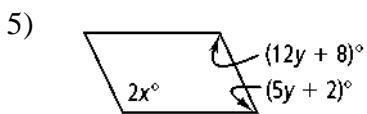
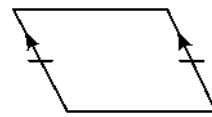Can you prove that the quadrilateral is a parallelogram based on the given information? Explain.
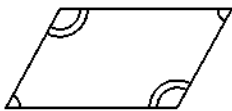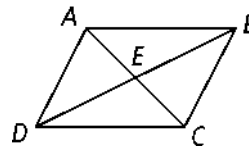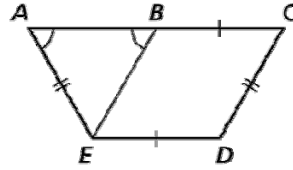
7)

8)

9)
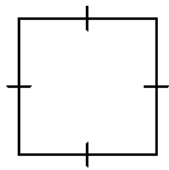
10)

11)

12) $\overline{AE} \cong \overline{EC},\ \overline{BE} \cong \overline{ED}$

13) Write a two-column proof.

Given: $\angle A \cong \angle ABE$
$\overline{AE} \cong \overline{CD}, \ \overline{BC} \cong \overline{DE}$
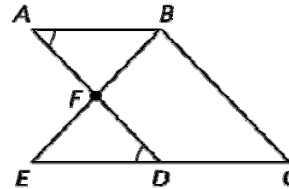Prove: $BCDE$ is a parallelogram.

Statement	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

14) Write a two-column proof.

Given: $\angle A \cong \angle FDE$
F is the midpoint of $\overline{AD}$.
D is the midpoint of $\overline{CE}$.
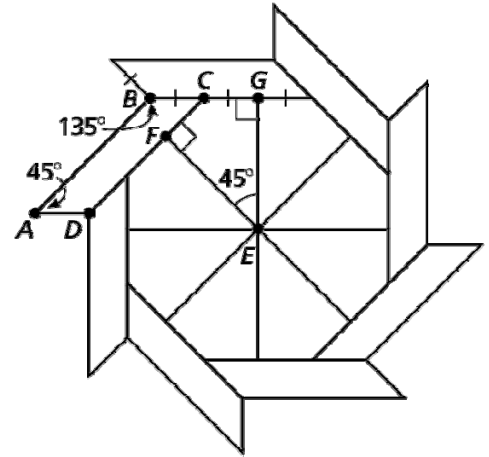Prove: $ABCD$ is a parallelogram.

Statement	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

15) An octagon star is shown in the figure on the right.

a) Find $m\angle FCG$, $m\angle BCF$, and $m\angle D$.

b) State which theorem you can use to show that the quadrilateral is a parallelogram.

c) The length of $\overline{AB}$ is three times the length of $\overline{AD}$. Write an expression for the perimeter of parallelogram $ABCD$ in terms of the variable x.