Determine whether each quadrilateral is a parallelogram. Justify your answer.

3. No

4. Yes, opp angles are \( \cong \)

ALGEBRA Find \( x \) and \( y \) so that each quadrilateral is a parallelogram.

5. \[
\begin{align*}
2x - 5 &= 3x - 18 \\
3y &= 2y + 12 \\
2y + 12 &= 3y
\end{align*}
\]
\( \implies \)
\( 2x - 5 = 13 \\
3y = 12 \\
y = 4 \)

6. \[
\begin{align*}
(3x - 17)^\circ &= (y + 58)^\circ \\
(5y - 6)^\circ &= (2x + 24)^\circ
\end{align*}
\]
\( \implies \)
\( 3x - 17 = 2x + 24 \\
x = 41 \)

7y = 64 \\
y = 16 \)

COORDINATE GEOMETRY Determine whether the figure with the given vertices is a parallelogram. Use the method indicated.

7. \( B(0, 0), C(4, 1), D(6, 5), E(2, 4) \); Slope Formula

\[
\text{slope of } ED = \frac{5 - 4}{6 - 2} = \frac{1}{4} \\
\text{slope of } BC = \frac{1 - 0}{4 - 0} = \frac{1}{4}
\]
so lines \( \parallel \)

\[
\text{slope of } BE = \frac{4 - 0}{2 - 0} = 2 \\
\text{slope of } CD = \frac{5 - 1}{6 - 4} = 2
\]
so lines \( \parallel \)

Yes \( \Box \) since opp sides are \( \parallel \)

8. \( E(-4, -3), F(4, -1), G(2, 3), H(-6, 2) \); Midpoint Formula

midpoint of \( EG = \left( \frac{-4 + 2}{2}, \frac{-3 + 3}{2} \right) = (-1,0) \)

midpoint of \( HF = \left( \frac{6 + 4}{2}, \frac{2 + 1}{2} \right) = (-1, \frac{1}{2}) \)

Not \( \Box \) diagonals do NOT have the same midpoint, so they do NOT bisect each other.
Determine whether each quadrilateral is a parallelogram. Justify your answer.

10. Yes \( \square \) since \( \text{opp } \angle \text{s are } \cong \). "Yes \( \square \) since diagonals bisect each other."  
11. Yes \( \square \), since \( \text{opp } \angle \text{s are } \cong \).

12. Not enough info
13. Yes \( \square \) since 1 pair of sides is \( \parallel \) and \( \cong \).
14. Not enough info

**ALGEBRA** Find \( x \) and \( y \) so that each quadrilateral is a parallelogram.

20. \( 2x = 5x - 18 \)
   \[ 18 = 3x \]
   \[ 6 = x \]

21. \( 2x + 3 = 5x \)
   \[ 3 = 3x \]
   \[ 1 = x \]

22. \( y + 2x = 4 \)
   \[ \rightarrow y = 4 - 2x \]

23. \( \angle s \text{ are } \parallel \) so \( \angle \text{s are } \cong \).
   \[ 40 = 10y \]
   \[ 4 = y \]
   \[ 100 = 25x \]
   \[ 4 = x \]
COORDINATE GEOMETRY The coordinates of three of the vertices of a parallelogram are given. Find the possible coordinates for the fourth vertex.

32. A(1, 4), B(7, 5), and C(4, -1)  
33. Q(-2, 2), R(1, 1), and S(-1, -1)

Use □NQRM to find each measure or value. (Lesson 6-2)

41. \( w = 12 \)  
42. \( x = \frac{3x + 2 = 14x - 2}{4x - x} \)  
43. \( NQ = 3(4) + 2 = 14 \)  
44. \( QR = 3y = 2y + 5 \)  
35. \( y = 5 \)

The measure of an interior angle of a regular polygon is given. Find the number of sides in each polygon. (Lesson 6-1)

45. 135  
46. 144  
47. 168  
48. 162

168\(n = 180(n - 2)\)
\[ 168n = 180n - 360 \]
\[ -12n = -360 \]
\[ n = 30 \]

162\(n = 180(n - 2)\)
\[ 162n = 180n - 360 \]
\[ -18n = -360 \]
\[ n = 20 \]

135\(n = 180(n - 2)\)
\[ 135n = 180n - 360 \]
\[ -45n = -360 \]
\[ n = 8 \]

144\(n = 180(n - 2)\)
\[ 144n = 180n - 360 \]
\[ -36n = -360 \]
\[ n = 10 \]
# 2) \[ \text{GIVEN: } \square XYZW, \overline{XZ} \cong \overline{WS} \]
\[ \text{PROVE: } \angle XYZ \cong \angle S \]

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<td>1. (\text{GIVEN})</td>
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<td>2. (\angle XYZ \cong \angle Z)</td>
<td>2. (\text{IN A } \square, \text{opp. } \angle \text{s are } \cong)</td>
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<td>3. (\angle Z \cong \angle S)</td>
<td>3. (\text{ISOSCELES } \triangle \text{ THM})</td>
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<td>4. (\angle XYZ \cong \angle S)</td>
<td>4. (\text{TRANSITIVE PROPR})</td>
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# 13) \[ \text{GIVEN: } \square DGHK, \overline{FH} \perp \overline{GD}, \overline{DJ} \perp \overline{HK} \]
\[ \text{PROVE: } \triangle DJK \cong \triangle HFG \]

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<td>1. (\text{GIVEN})</td>
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<td>2. (\angle HFG \cong \angle DJK)</td>
<td>2. (\text{DEF. of } \perp)</td>
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<td>3. (\triangle HFG \cong \triangle DJK)</td>
<td>3. (\text{RIGHT } \angle \text{s THM})</td>
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<td>4. (\overline{GH} \cong \overline{DK})</td>
<td>4. (\text{IN A } \square, \text{opp. sides are } \cong)</td>
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<tr>
<td>5. (\angle G \cong \angle K)</td>
<td>5. (\text{IN A } \square, \text{opp. } \angle \text{s are } \cong)</td>
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<tr>
<td>6. (\triangle DJK \cong \triangle HFG)</td>
<td>6. (\text{AAS})</td>
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