

10.

Statements	Reasons
1) $m \parallel n$	1) Given
2) $\angle 1 \cong \angle 3$	2) Corresponding Angles Theorem
3) $\angle 3 \cong \angle 2$	3) Vertical Angles Theorem
4) $\angle 1 \cong \angle 2$	4) Transitive Property of Congruence

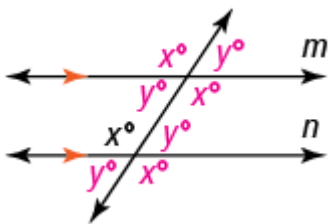
11. If we apply the Same-Side Interior Angles Postulate, we can see that $\angle 1$ and $\angle 3$ are supplementary and $\angle 2$ and $\angle 4$ are supplementary because both angle pairs are same-side interior angles.

12. While there is no Same-Side Exterior Angles Theorem given, same-side exterior angles are supplementary, not congruent. Thus, we can find $m\angle 1$ as follows:

$$m\angle 1 + 72 = 180^\circ$$

$$m\angle 1 = 108^\circ$$

13.



14. Remember that alternate Interior angles are congruent and same-side exterior angles are supplementary.

This gives the following equations:

$$5v^\circ = 2w^\circ$$
$$10w^\circ + 5v^\circ = 180^\circ$$

Solve the second equation for v :

$$5v^\circ = 180^\circ - 10w^\circ$$
$$v = \frac{180^\circ - 10w^\circ}{5^\circ}$$
$$v = 36^\circ - 2w^\circ$$

Now substitute this into $5v^\circ = 2w^\circ$.

$$5(36^\circ - 2w^\circ) = 2w^\circ$$
$$180^\circ - 10w^\circ = 2w^\circ$$
$$180^\circ = 12w^\circ$$
$$w = \frac{180^\circ}{12} = 15$$

Now substitute this value of w into $v = 36^\circ - 2w^\circ$ to find v .

$$v = 36^\circ - 2 \cdot 15^\circ$$
$$v = 36^\circ - 30^\circ = 6^\circ$$

So $w = 15^\circ$ and $v = 6^\circ$.

15. Answers may vary. Sample: $\angle 4$ and $\angle 7$
16. Answers may vary. Sample: $\angle 7$ and $\angle 3$
17. Answers may vary. Sample: $\angle 6$ and $\angle 3$

- 18.** If we apply the Corresponding Angles Theorem, we see that $\angle 5$ is congruent to $\angle 1$. We use this information to deduce that, since $\angle 5$ is congruent to $\angle 1$, and $\angle 5$ is congruent to $\angle 4$ by the Alternate Interior Angles Theorem, then $\angle 1$ is congruent to $\angle 4$. Following the same rules, $\angle 1$ is congruent to $\angle 8$.

Applying the Same-Side Interior Angles Postulate, we see that $\angle 5$ is supplementary to $\angle 3$, and thus, $\angle 1$ is supplementary to $\angle 3$. We can apply the same rules to $\angle 4$ to find that $\angle 1$ is supplementary to $\angle 6$.

Since $\angle 5$ and $\angle 4$ are Same-Side Exterior Angles of and supplementary to $\angle 7$ and $\angle 2$, we can then conclude that $\angle 1$ is supplementary to $\angle 7$ and $\angle 2$.

Supplementary angles to $\angle 1$: $\angle 3$, $\angle 2$, $\angle 7$.

Congruent angles to $\angle 1$: $\angle 4$, $\angle 5$, $\angle 8$.

- 19.** By applying the Alternate Interior Angles Theorem, we can conclude from the diagram that $m\angle 1 = 123^\circ$.
- 20.** By applying the Same-Side Interior Angles Postulate, we can conclude from the diagram that

$$m\angle 2 + 123^\circ = 180^\circ$$

$$m\angle 2 = 57^\circ$$