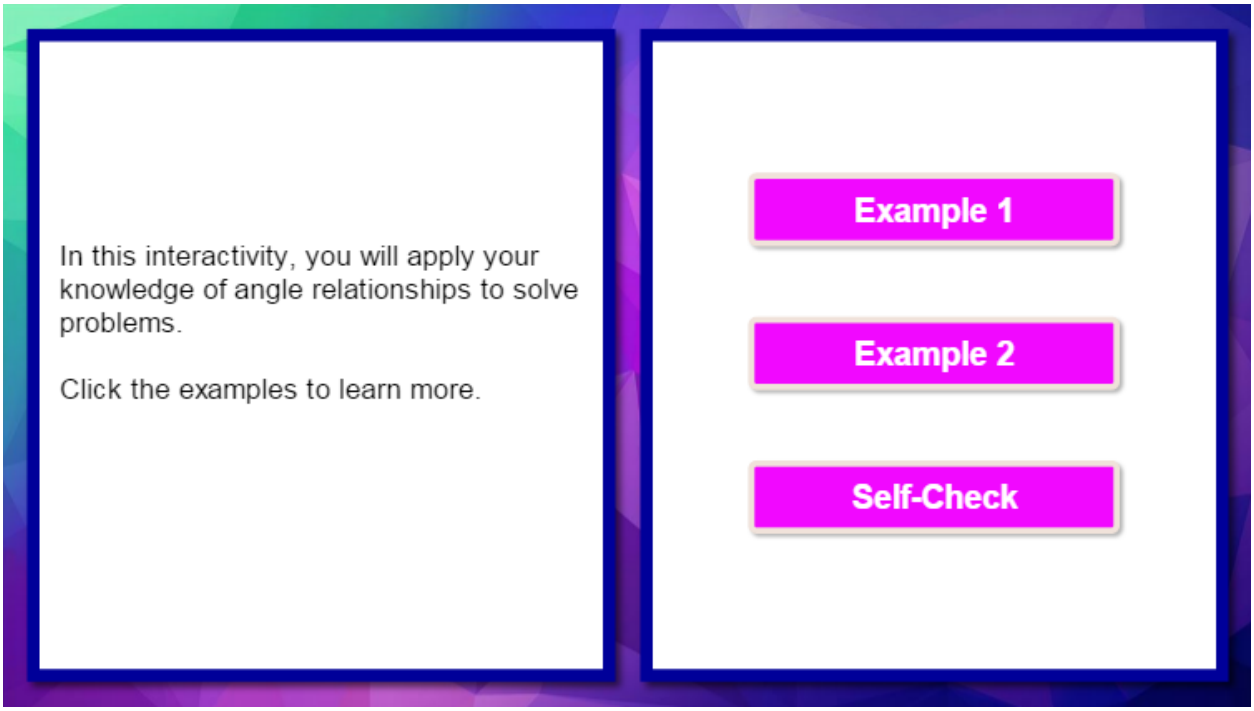
Module 2: Angles Formed by a Transversal Intersecting Parallel Lines

Topic 1 Content: Using Angle Relationships to Solve Problems

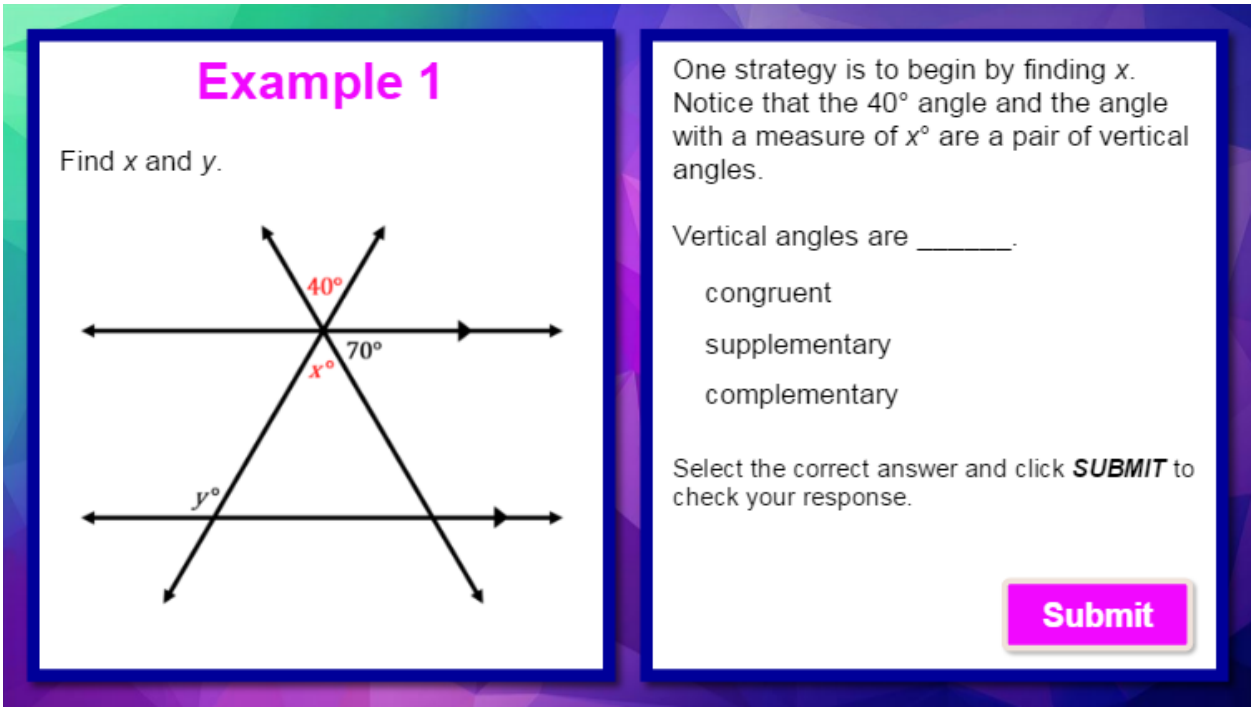
Introduction



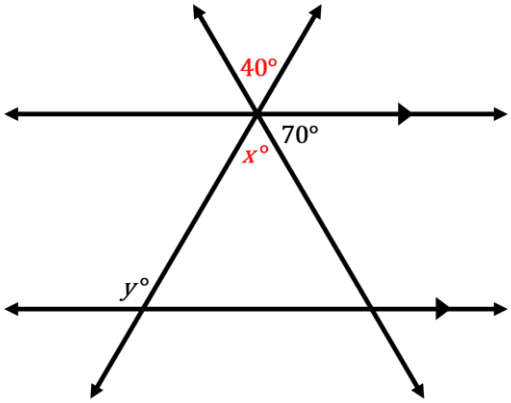
In this interactivity, you will apply your knowledge of angle relationships to solve problems.

Click the examples to learn more.

Example 1



Find *x* and *y*.



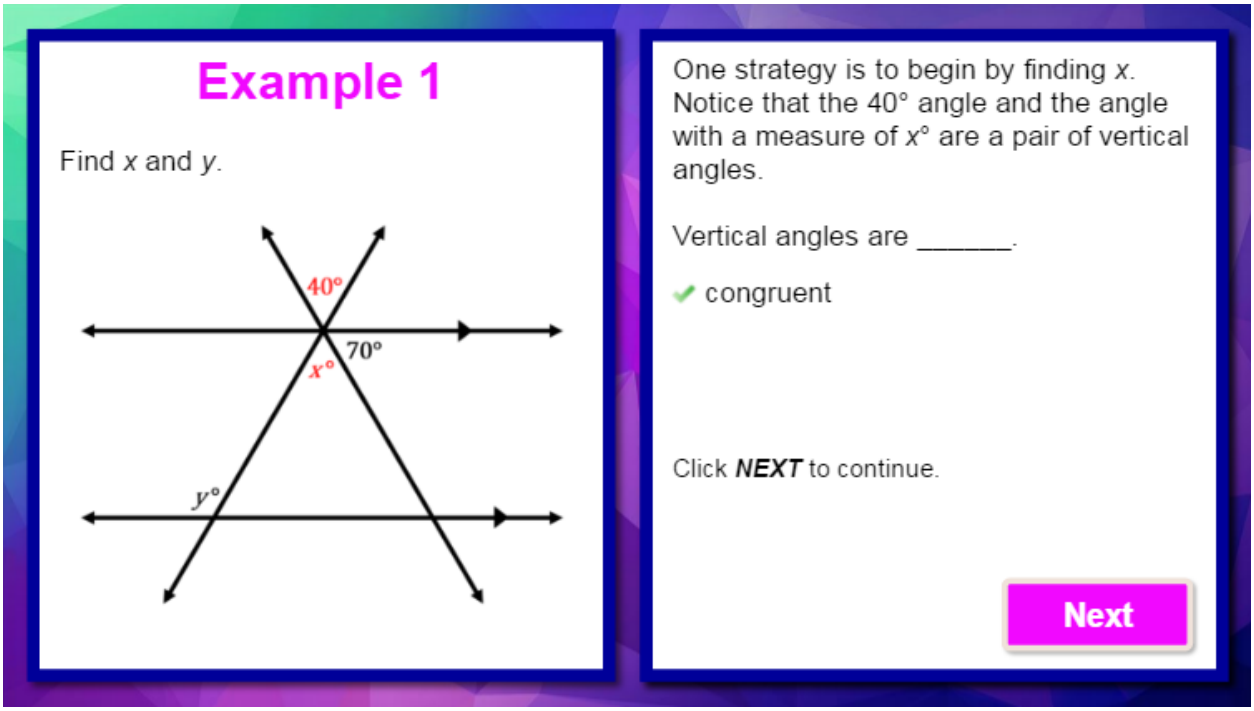
One strategy is to begin by finding *x*. Notice that the 40° angle and the angle with a measure of x° are a pair of vertical angles.

Vertical angles are _____.

congruent
supplementary
complementary

Select the correct answer and click ***SUBMIT*** to check your response.

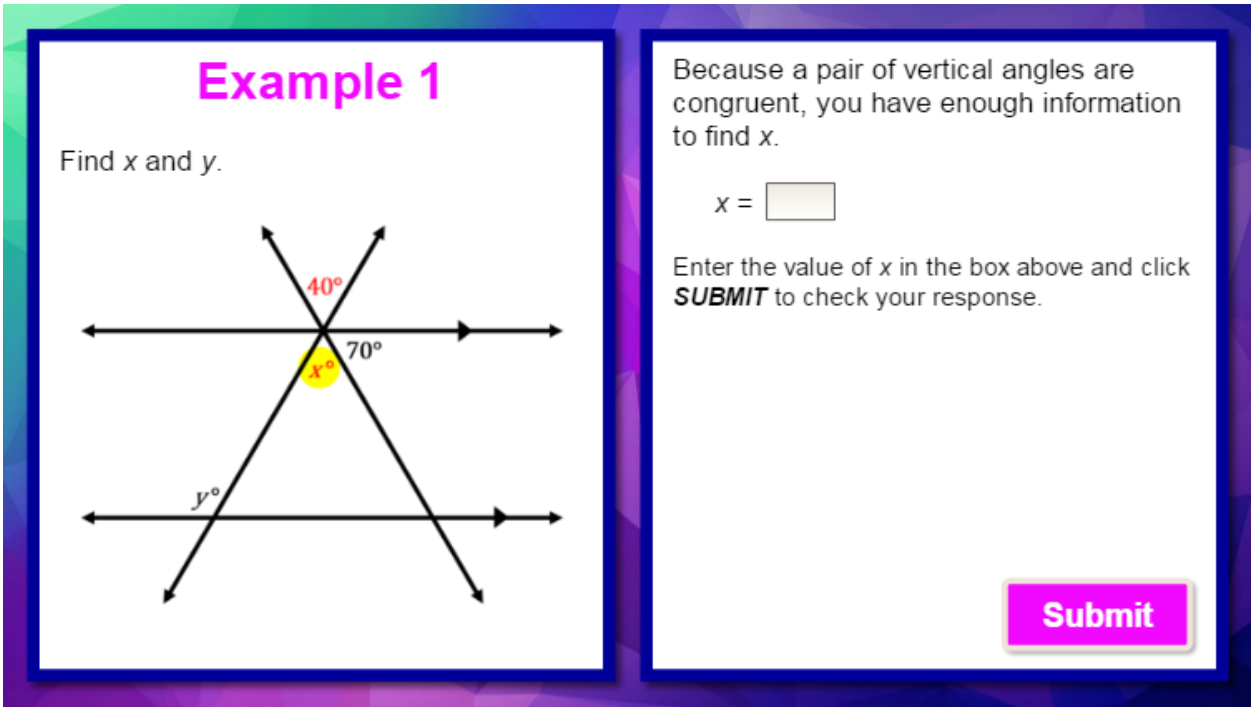
Example 1 (continued)



The correct answer is *congruent*. Vertical angles are congruent.

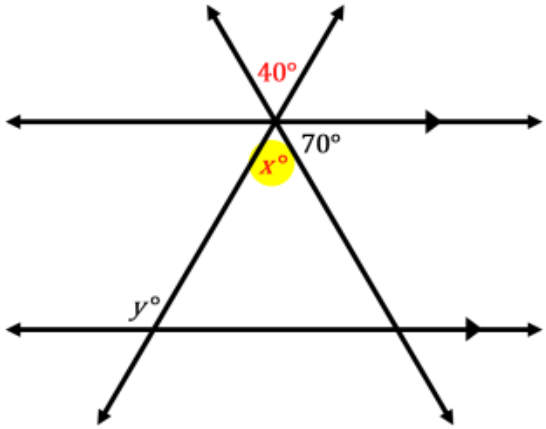
Click ***NEXT*** to continue.

Example 1 (continued)



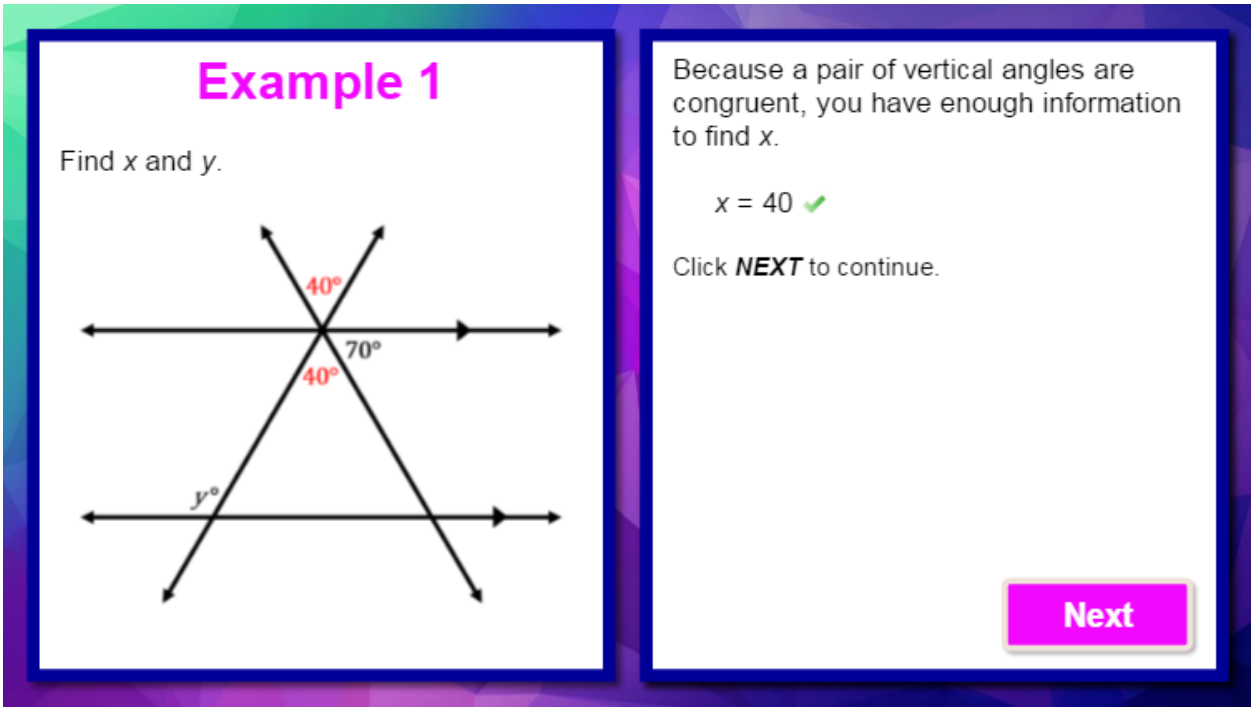
Because a pair of vertical angles are congruent, you have enough information to find x.

$x =$ _____



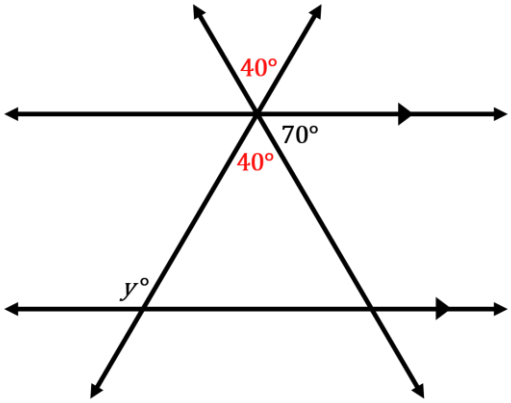
Enter the value of x in the box above and click ***SUBMIT*** to check your response.

Example 1 (continued)



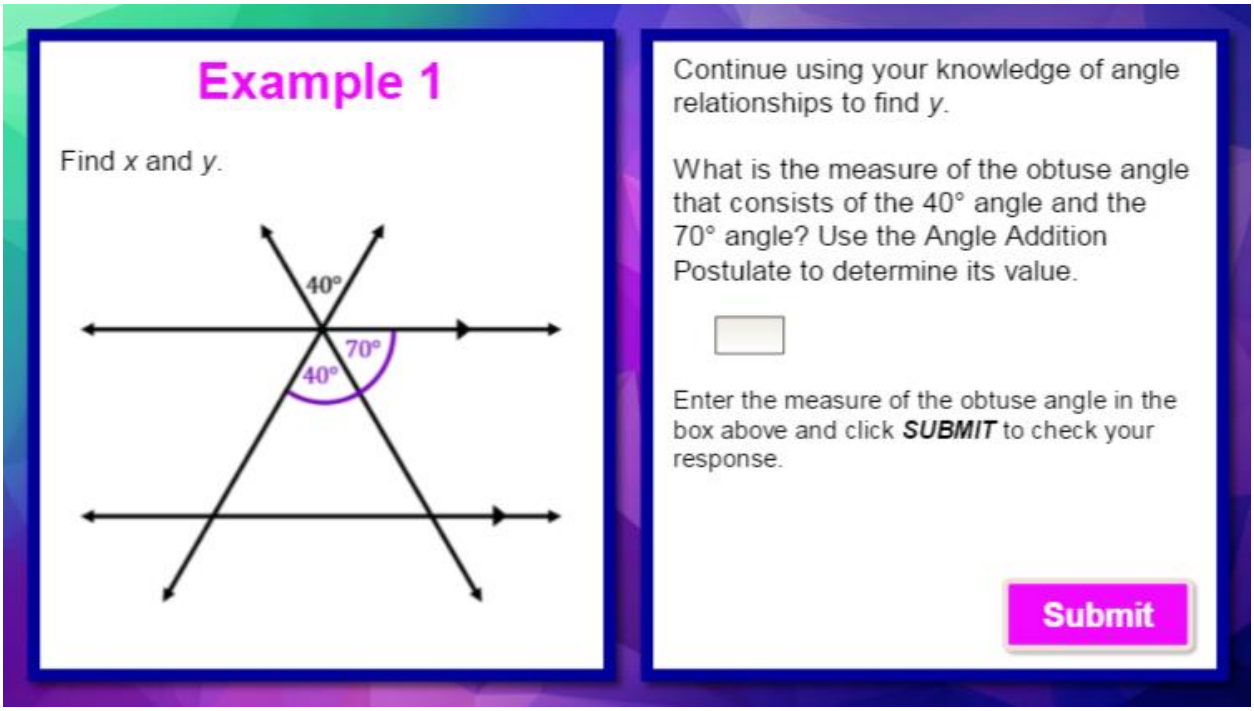
The correct answer is 40.

$x = 40$



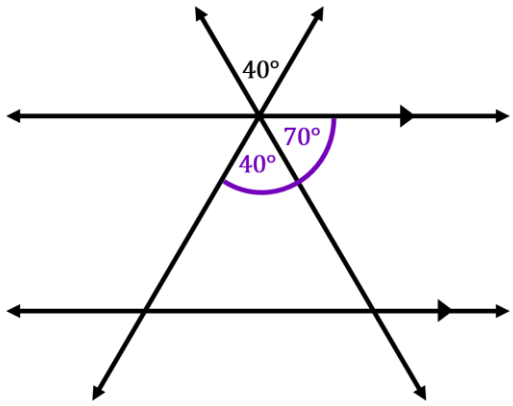
Click ***NEXT*** to continue.

Example 1 (continued)



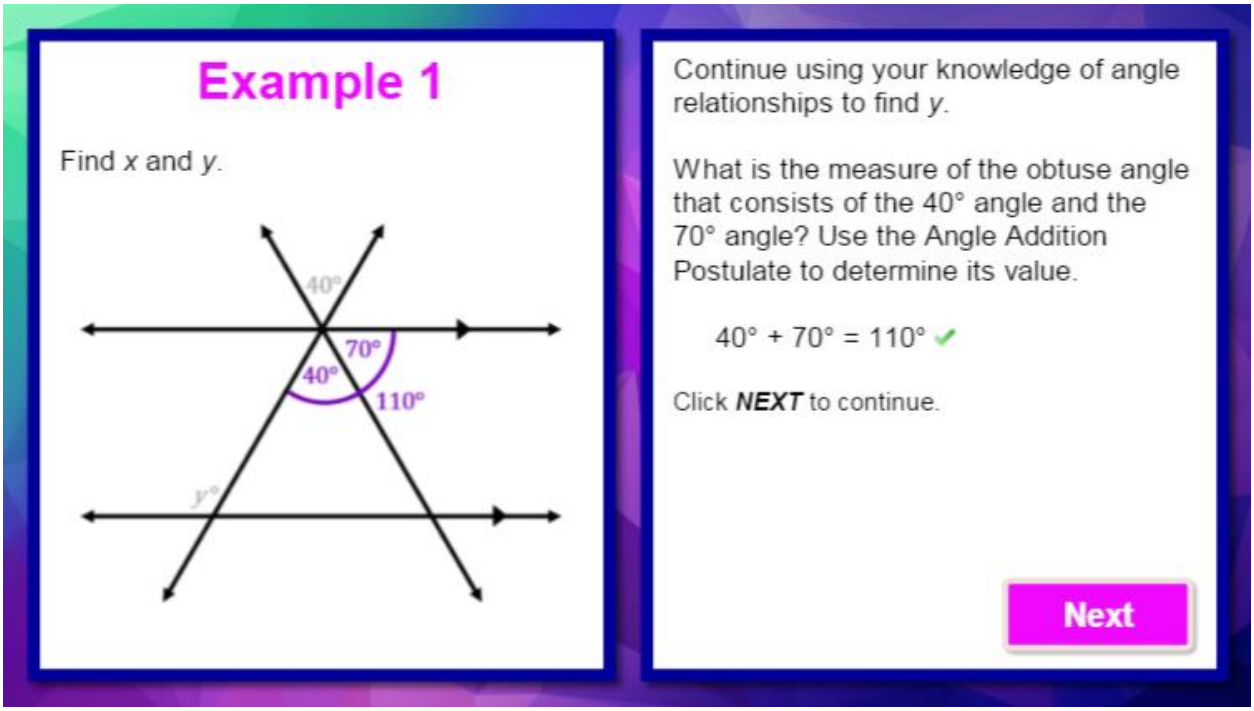
Continue using your knowledge of angle relationships to find *y*.

What is the measure of the obtuse angle that consists of the 40° angle and the 70° angle? Use the Angle Addition Postulate to determine its value.



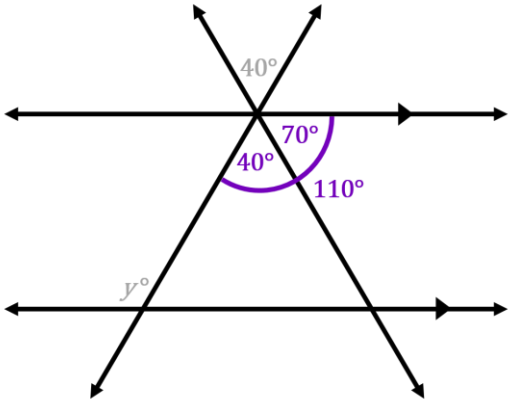
Enter the measure of the obtuse angle in the box above and click ***SUBMIT*** to check your response.

Example 1 (continued)



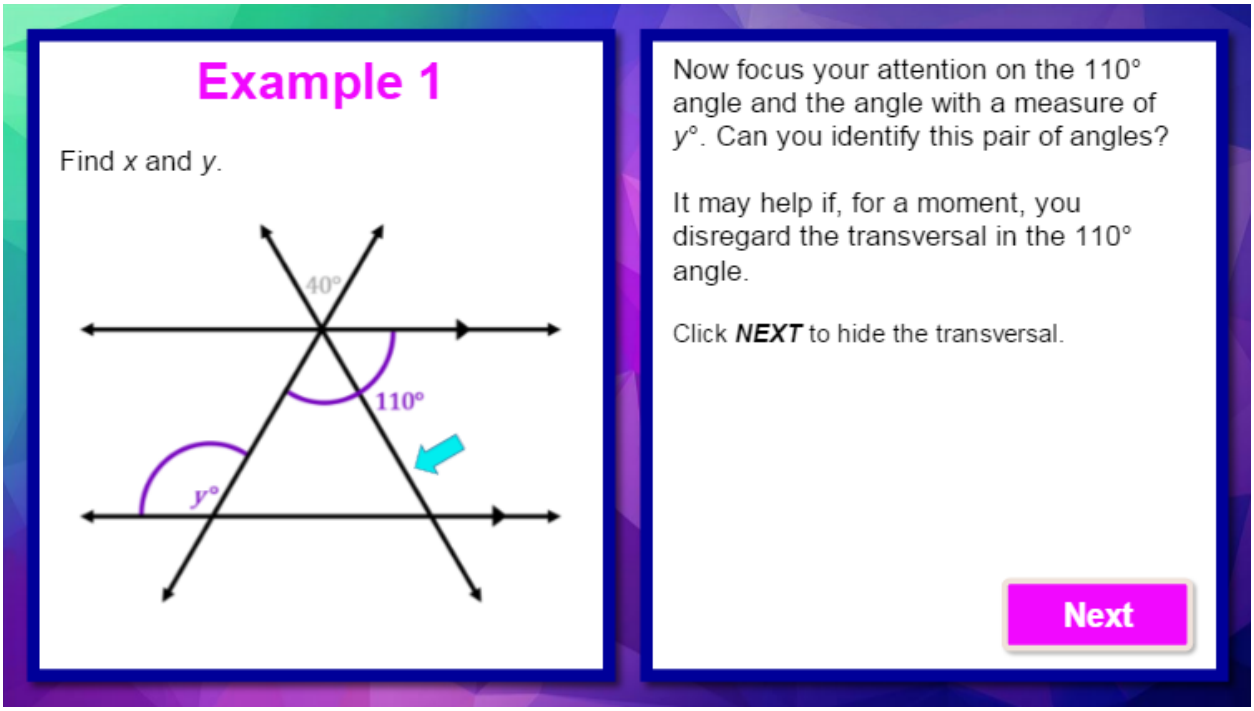
The correct answer is 110°.

$$40° + 70° = 110°$$



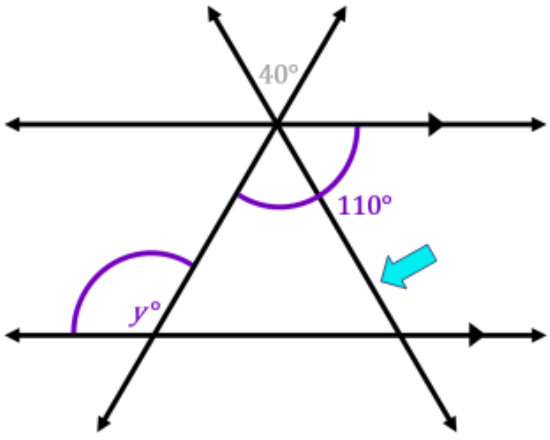
Click ***NEXT*** to continue.

Example 1 (continued)



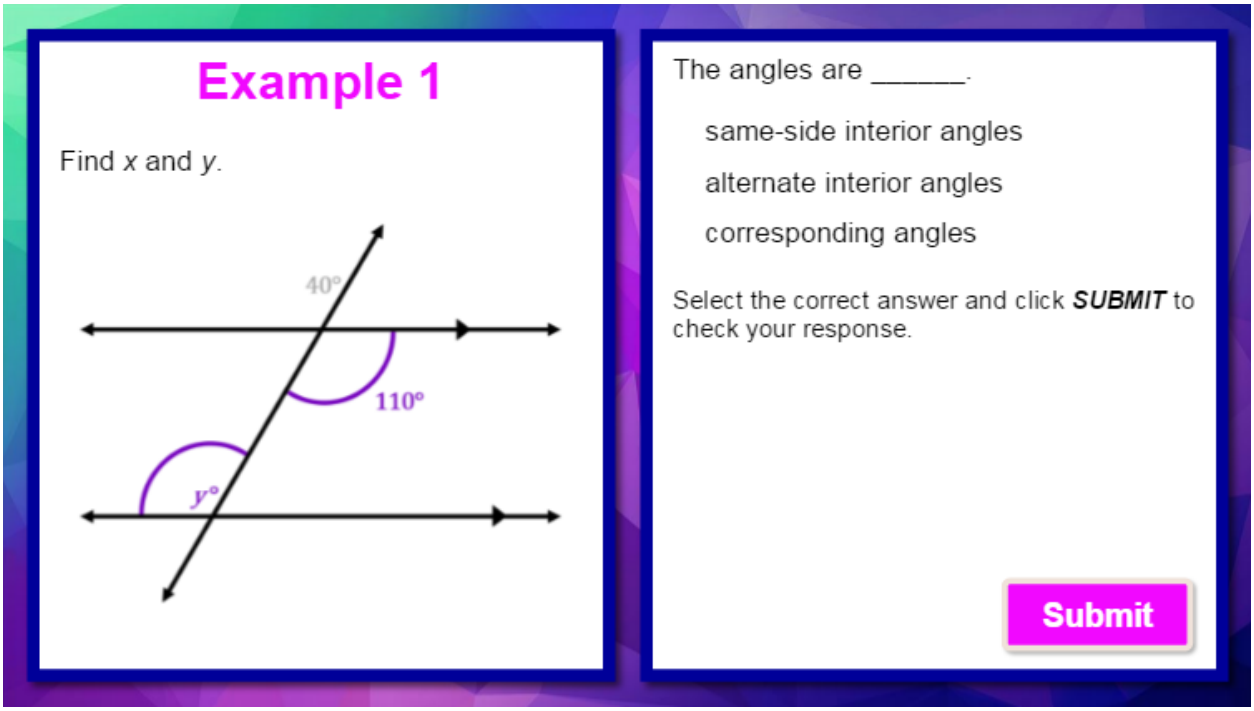
Now focus your attention on the 110° angle and the angle with a measure of $y°$. Can you identify this pair of angles?

It may help if, for a moment, you disregard the transversal in the 110° angle.



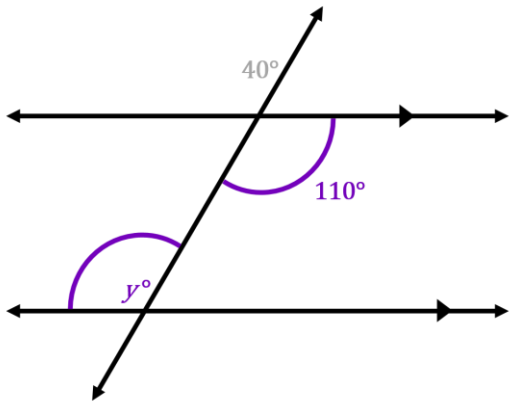
Click ***NEXT*** to hide the transversal.

Example 1 (continued)



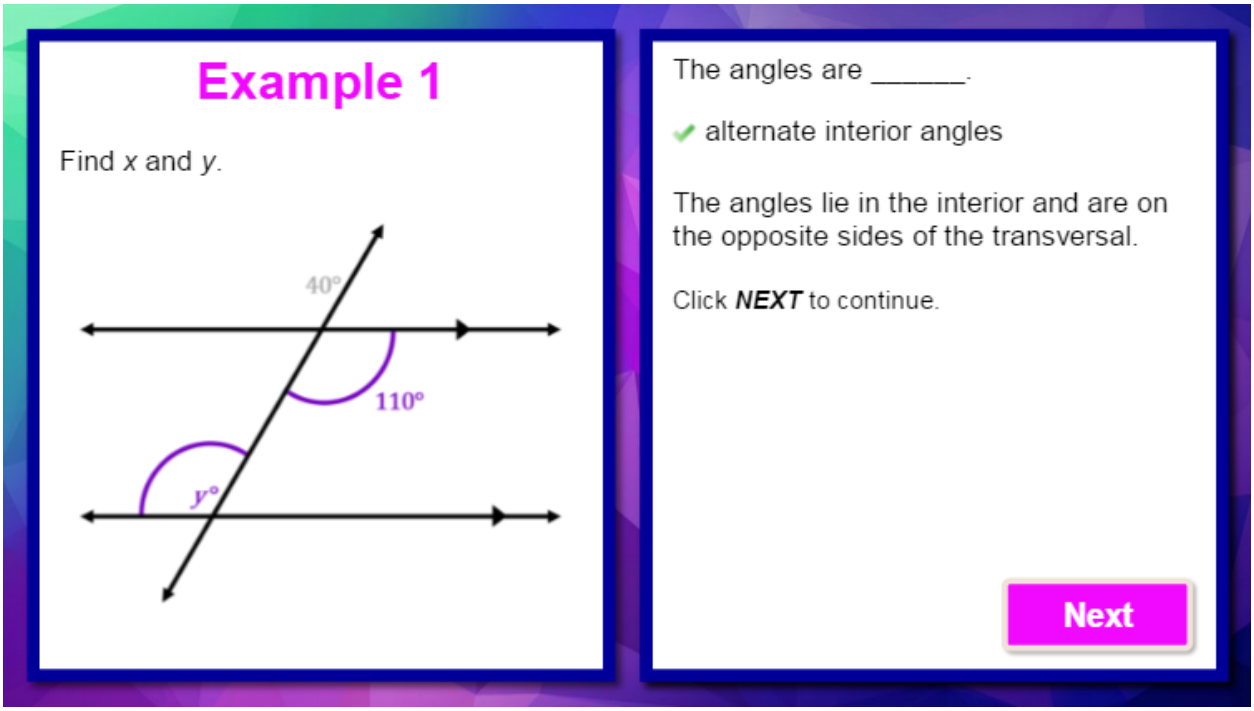
The angles are _____.

same-side interior angles
alternate interior angles
corresponding angles



Select the correct answer and click ***SUBMIT*** to check your response.

Example 1 (continued)

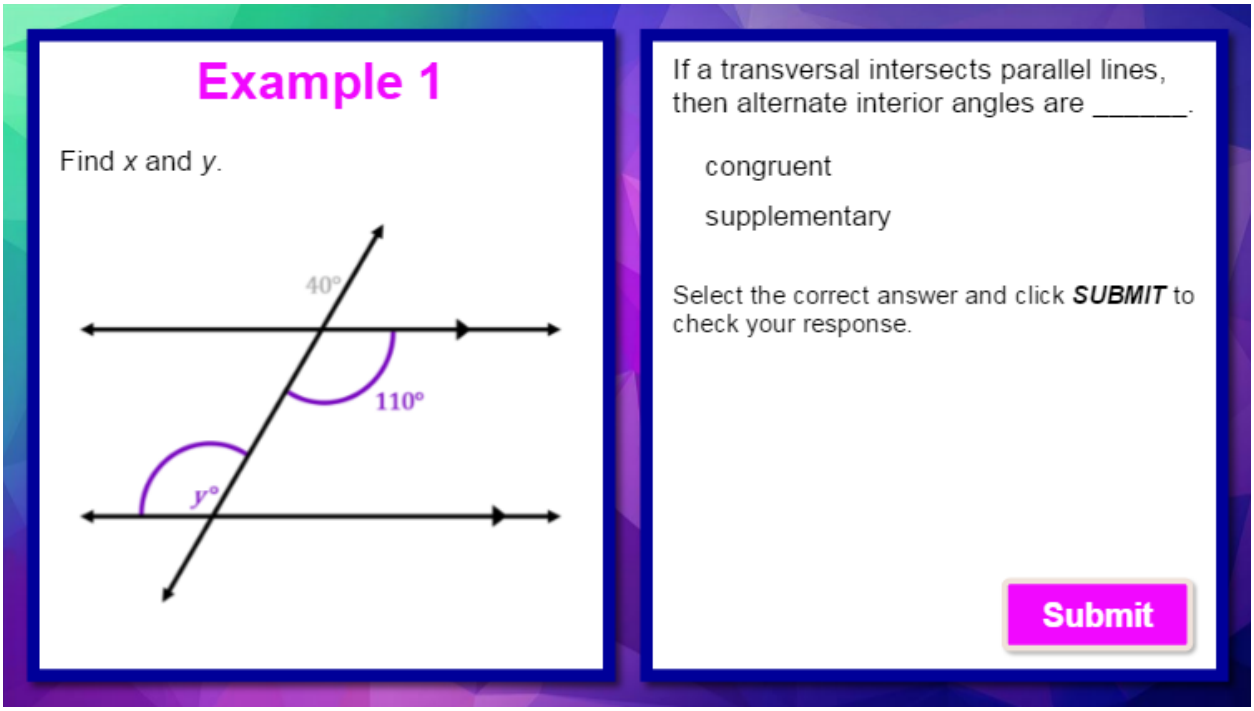


The correct answer is *alternate interior angles*. The angles are alternate interior angles.

The angles lie in the interior and are on the opposite sides of the transversal.

Click ***NEXT*** to continue.

Example 1 (continued)

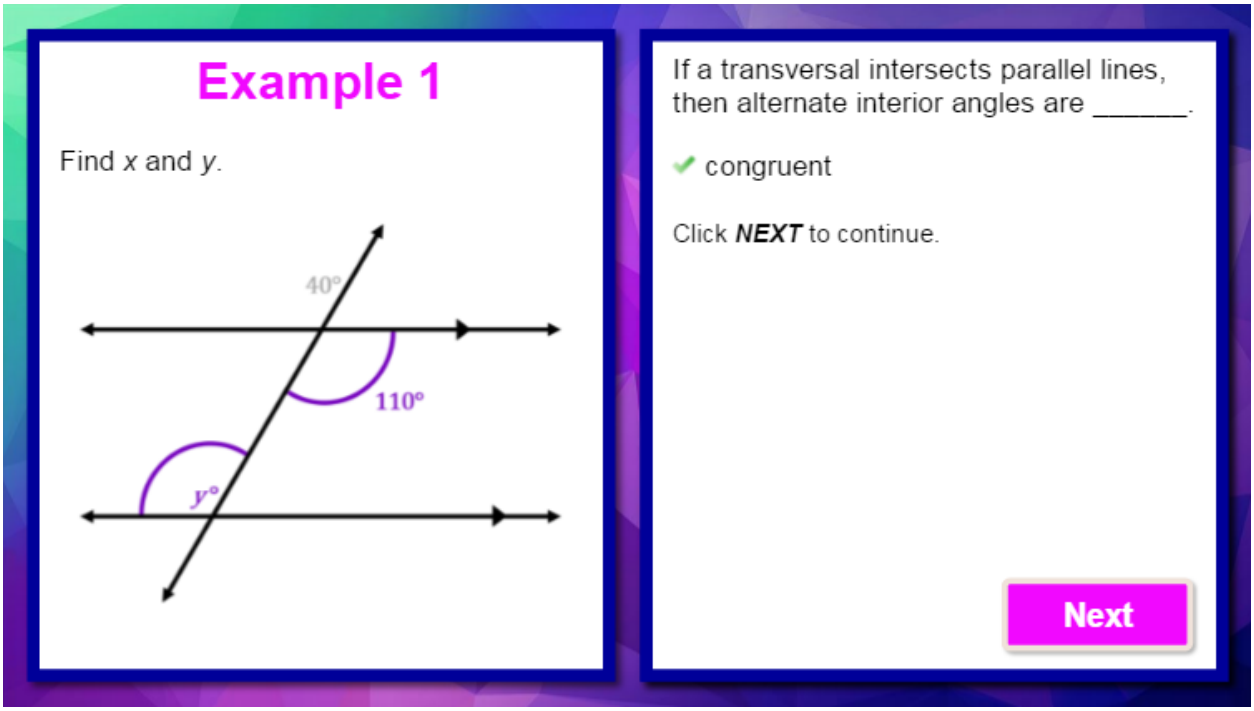


If a transversal intersects parallel lines, then alternate interior angles are _____.

congruent
supplementary

Select the correct answer and click ***SUBMIT*** to check your response.

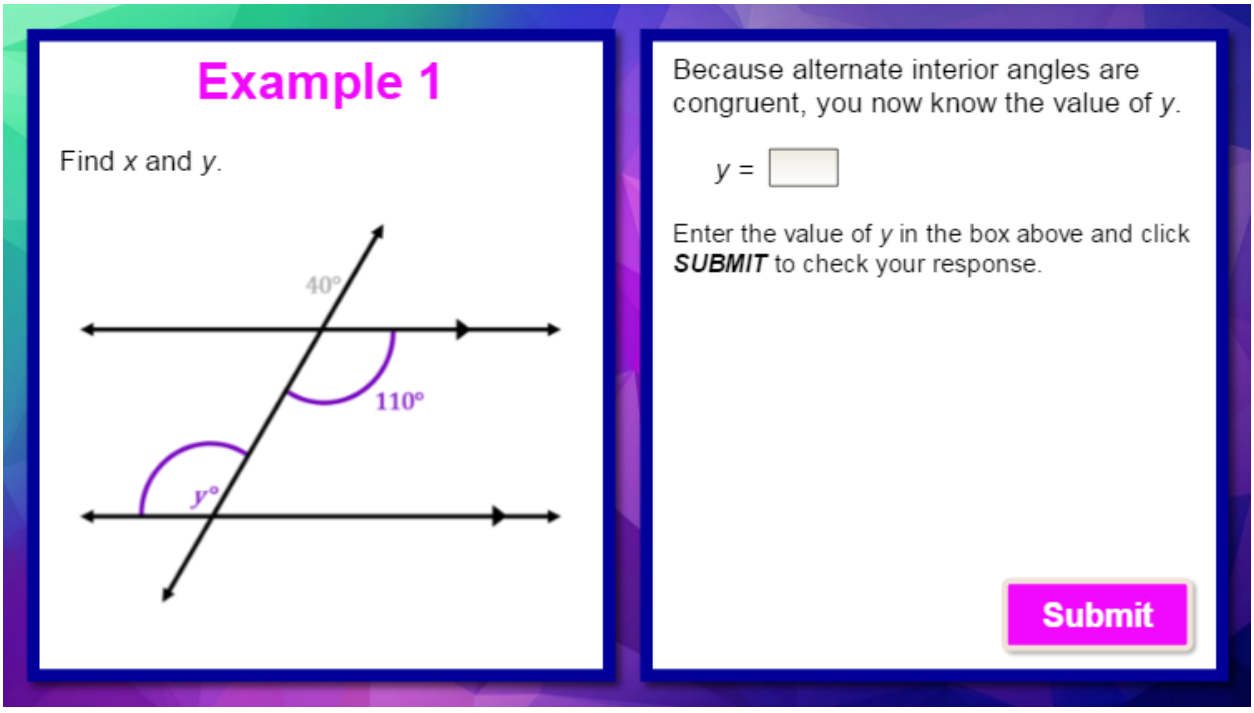
Example 1 (continued)



The correct answer is *congruent*. If a transversal intersects parallel lines, then alternate interior angles are congruent.

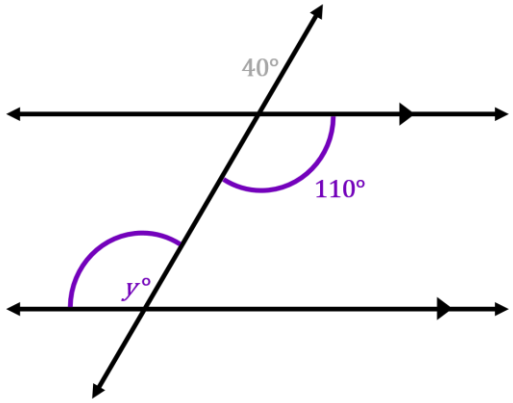
Click ***NEXT*** to continue.

Example 1 (continued)



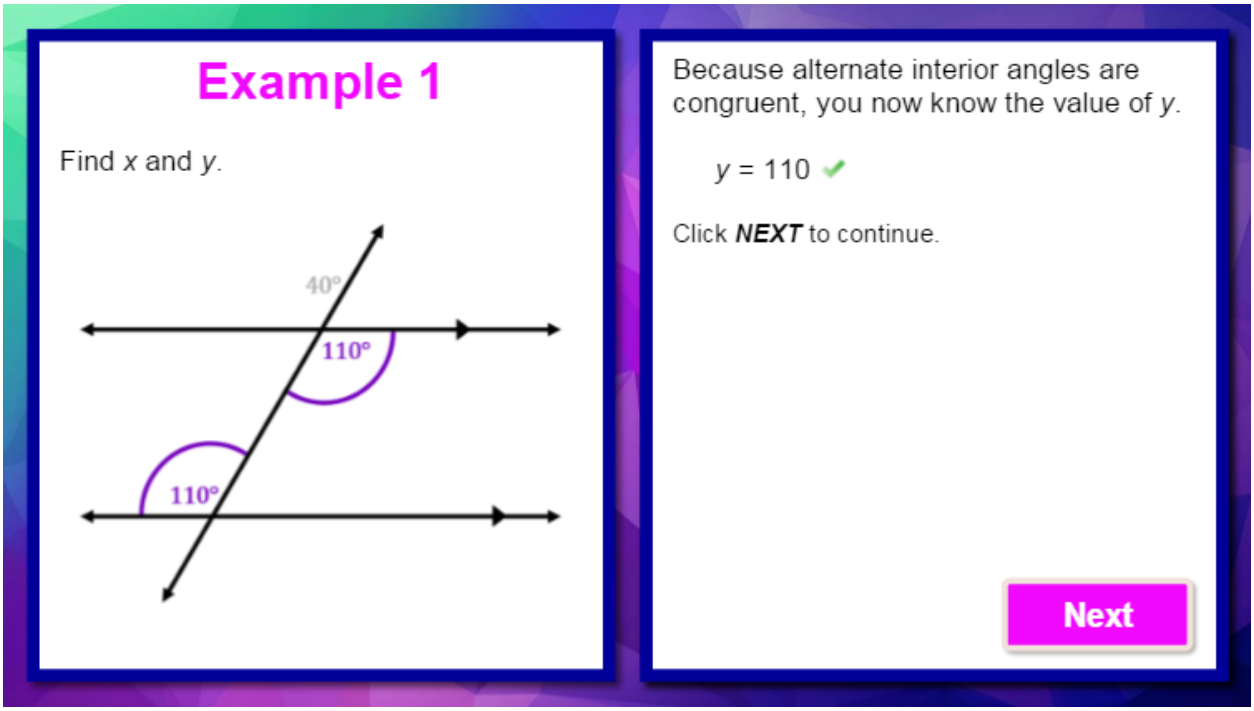
Because alternate interior angles are congruent, you now know the value of *y*.

$y =$ _____



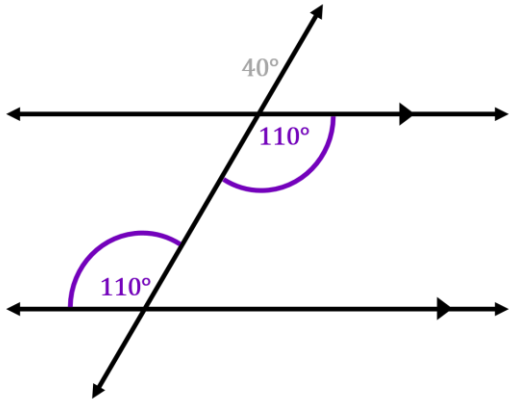
Enter the value of *y* in the box above and click ***SUBMIT*** to check your response.

Example 1 (continued)



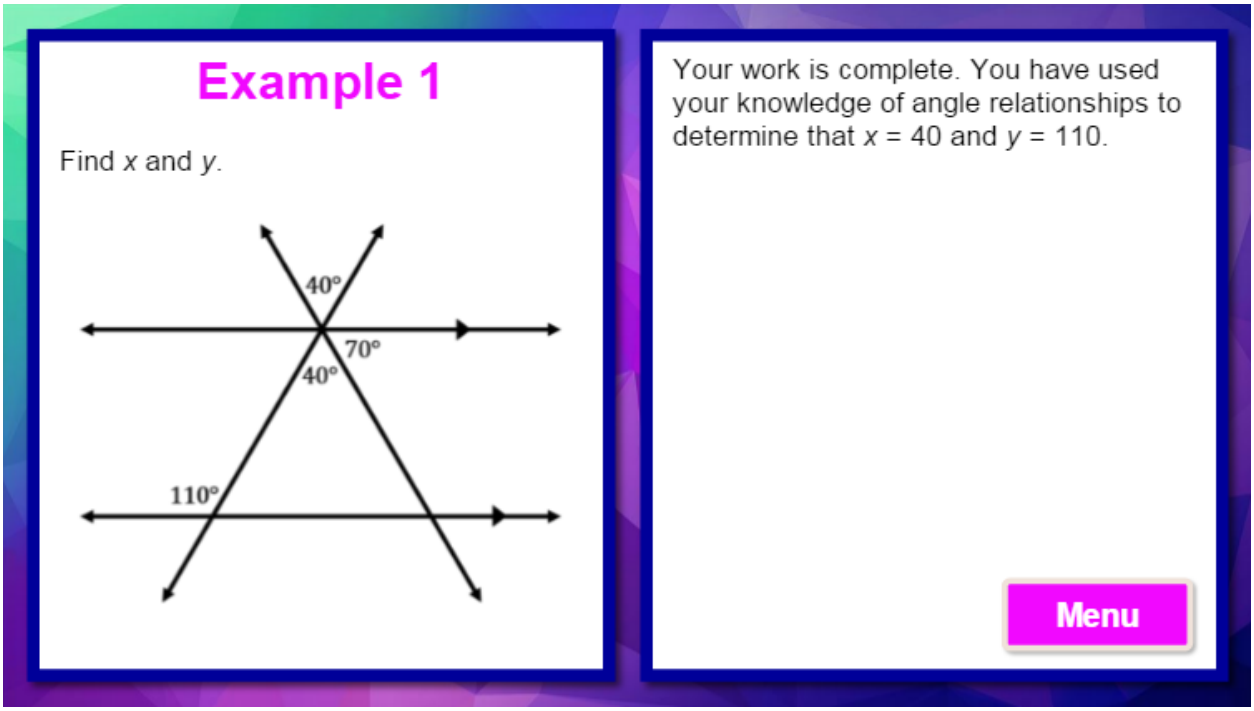
The correct answer is 110.

$y = 110$

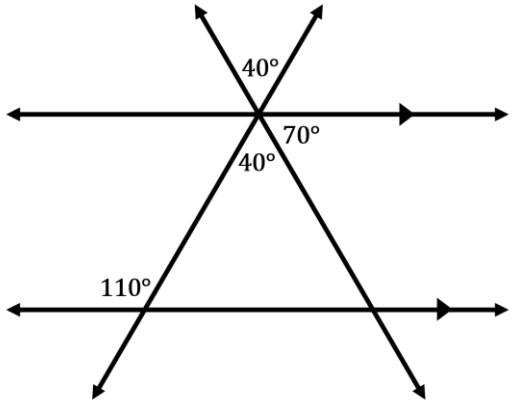


Click ***NEXT*** to continue.

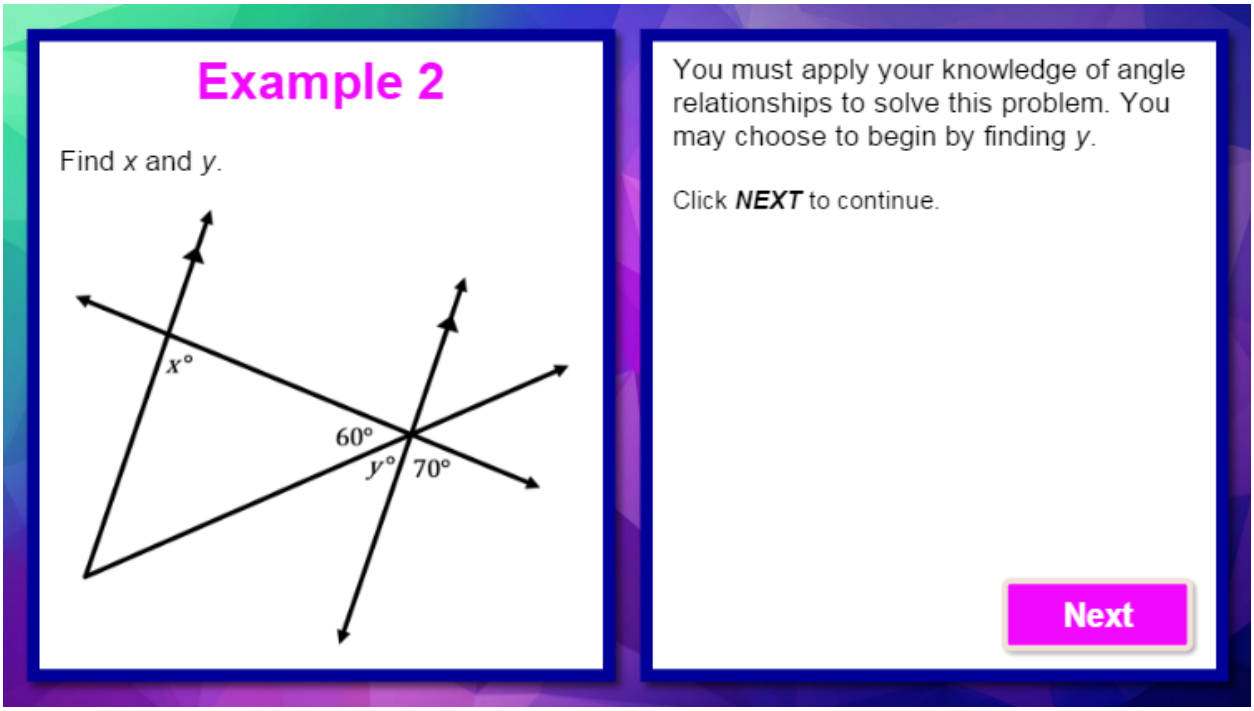
Example 1 (continued)



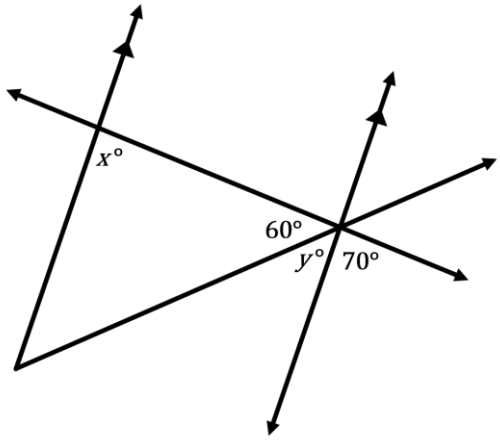
Your work is complete. You have used your knowledge of angle relationships to determine that $x = 40$ and $y = 110$.



Example 2



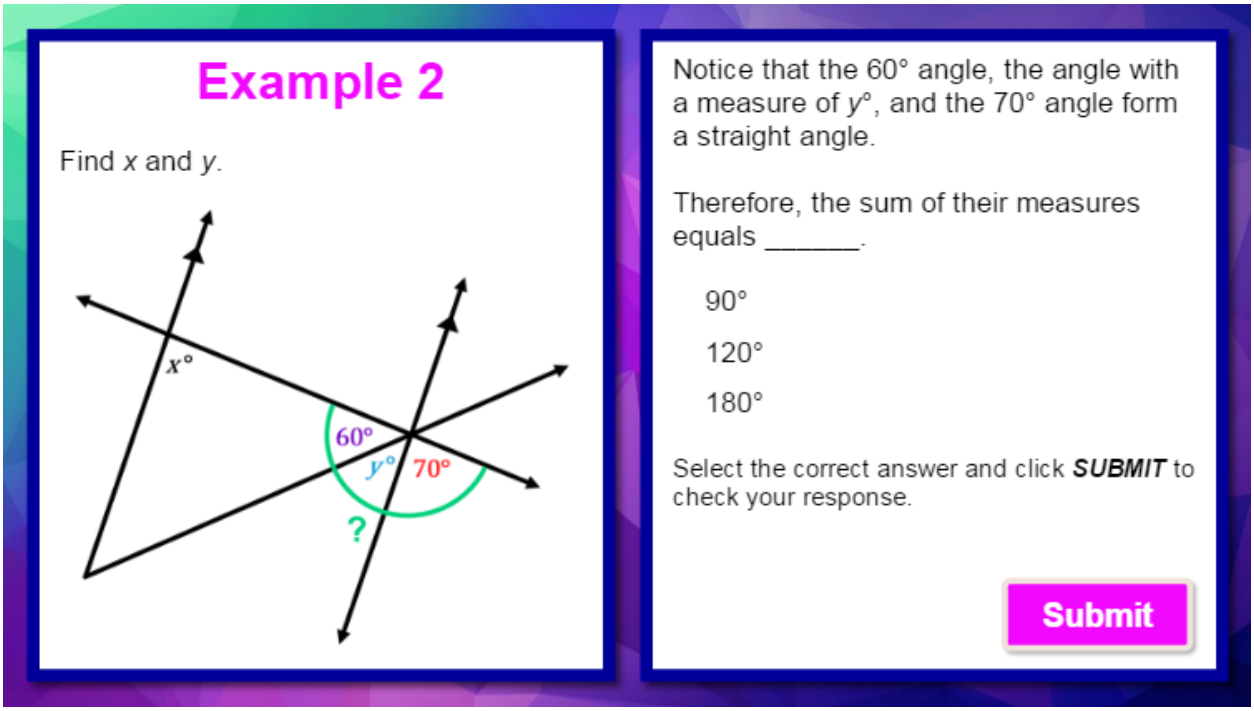
Find x and y.



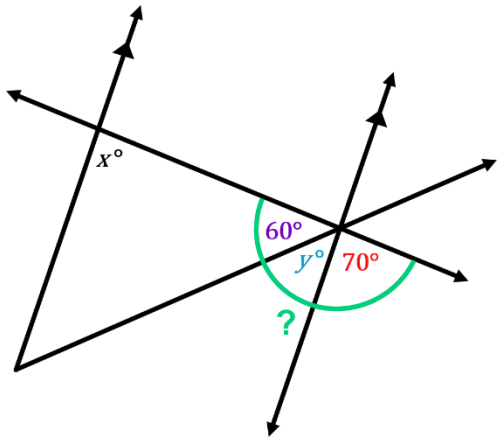
You must apply your knowledge of angle relationships to solve this problem. You may choose to begin by finding y.

Click ***NEXT*** to continue.

Example 2 (continued)



Notice that the 60° angle, the angle with a measure of $y°$, and the 70° angle form a straight angle.

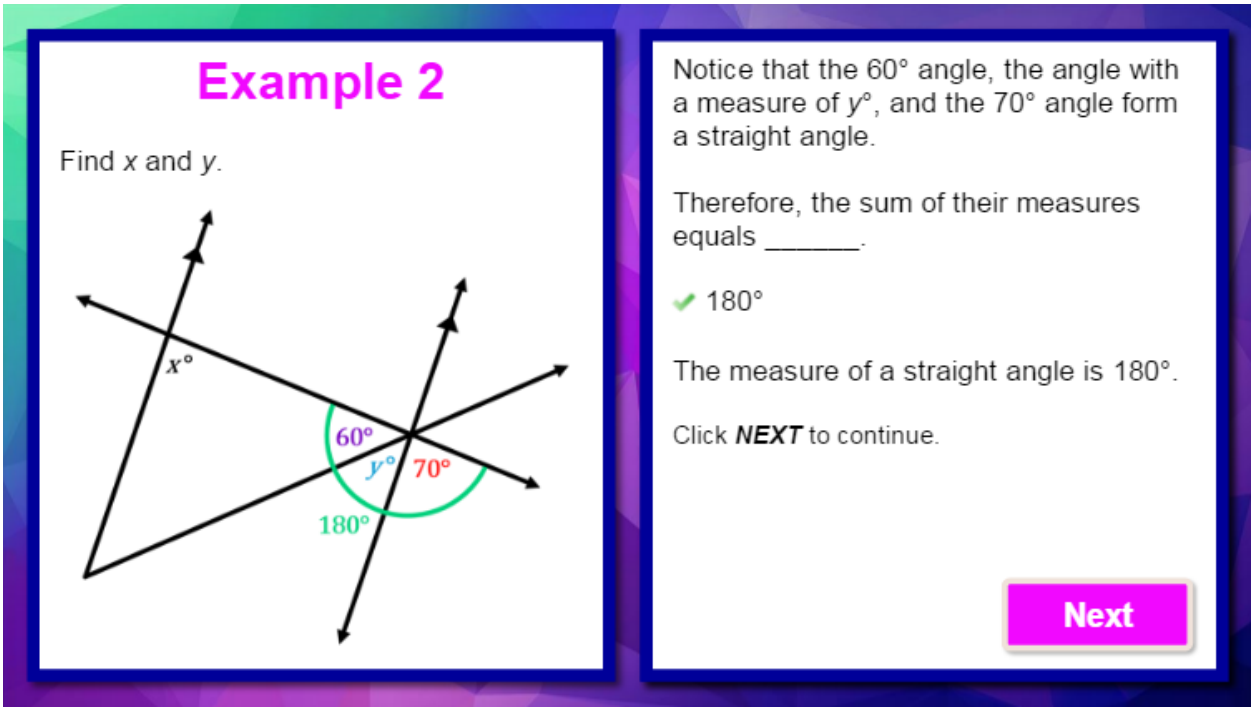


Therefore, the sum of their measures equals _____.

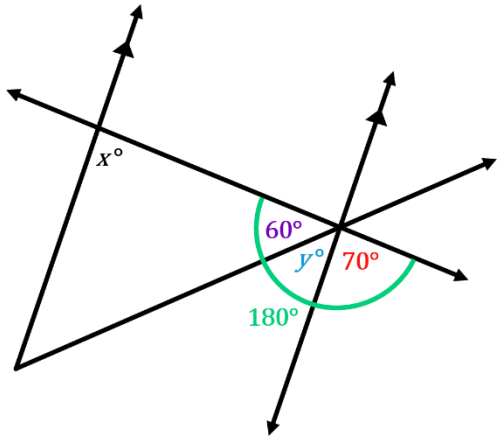
90°
120°
180°

Select the correct answer and click S*UBMIT* to check your response.

Example 2 (continued)

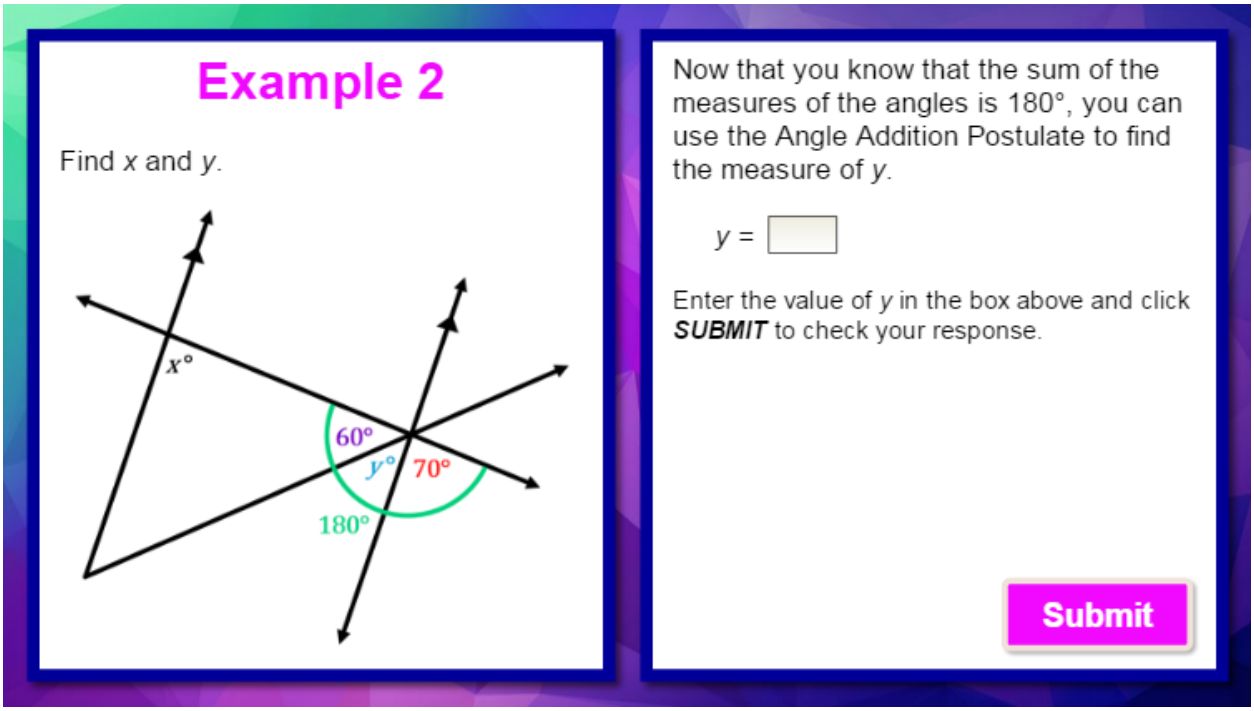


The correct answer is 180°. The measure of a straight angle is 180°.

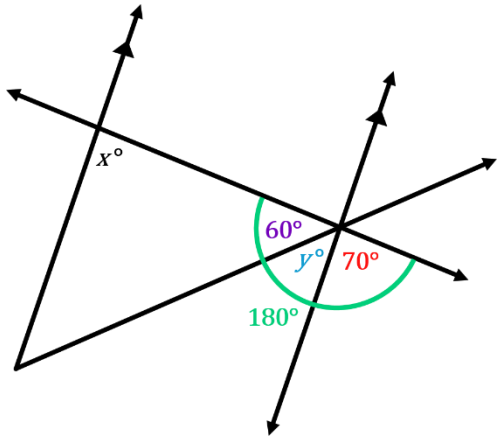


Click ***NEXT*** to continue.

Example 2 (continued)



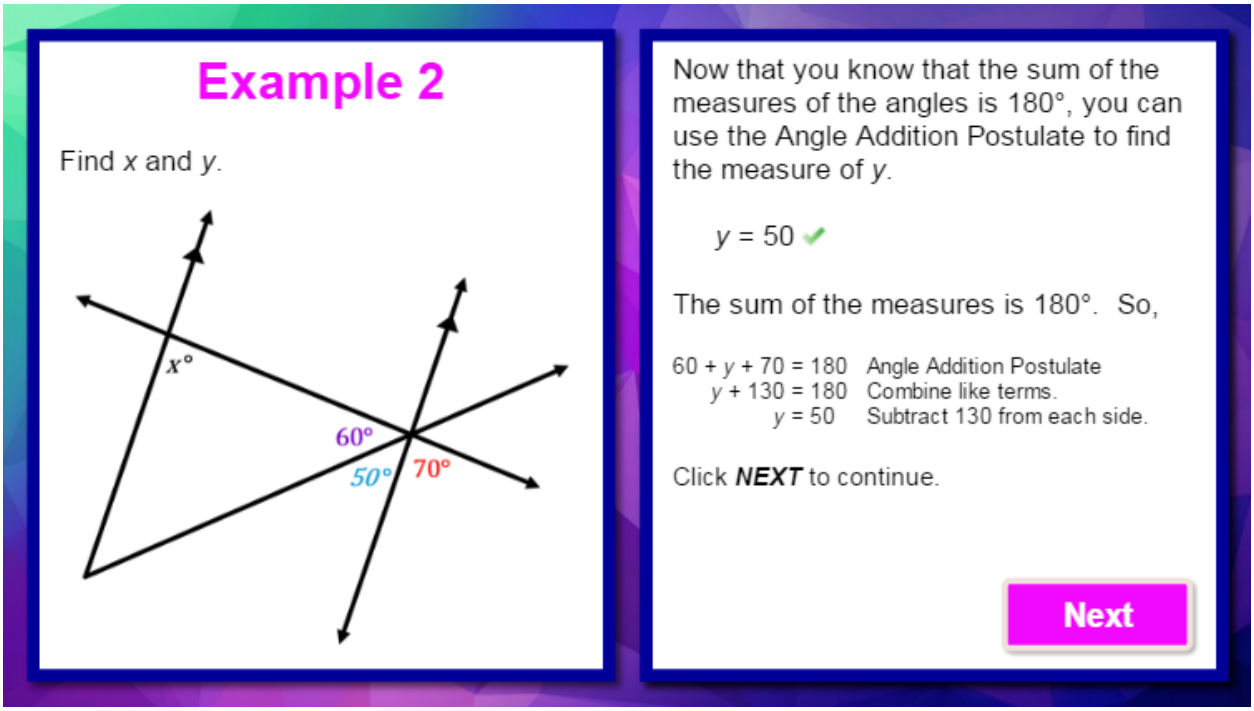
Now that you know that the sum of the measures of the angles is 180°, you can use the Angle Addition Postulate to find the measure of *y*.



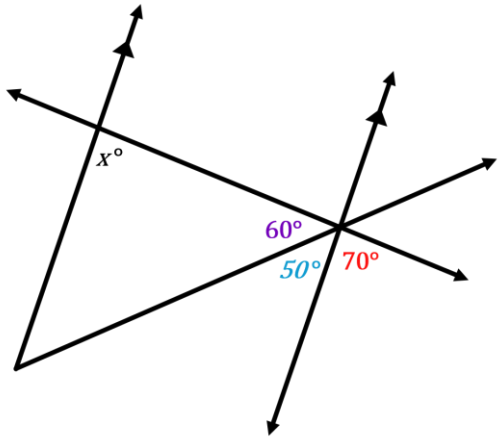
$y =$ _____

Enter the value of *y* in the box above and click ***SUBMIT*** to check your response.

Example 2 (continued)



The correct answer is 50.

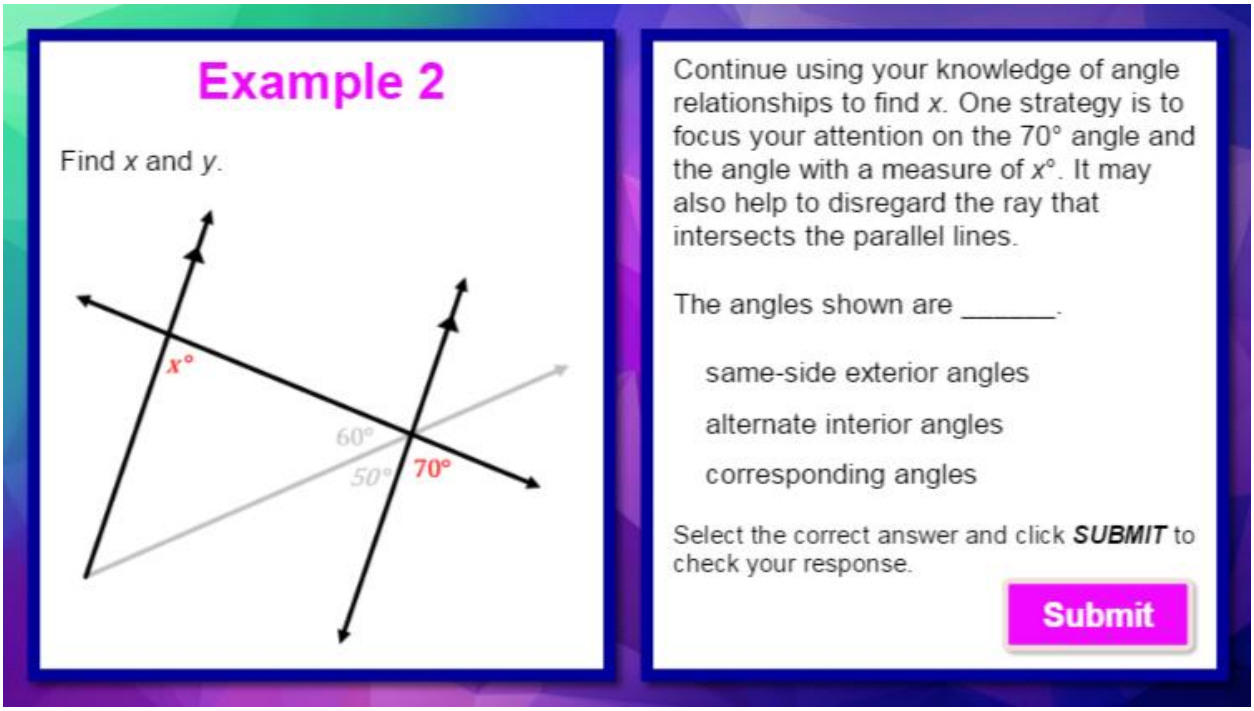


The sum of the measures is 180°. So,

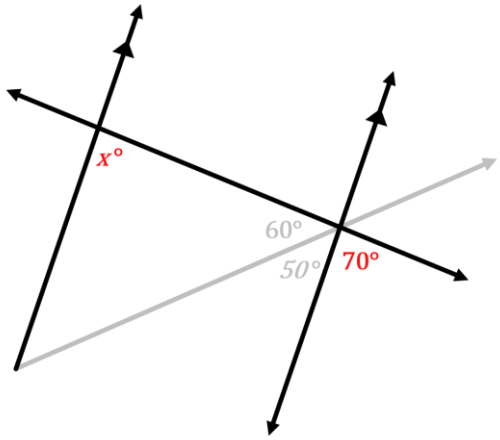
$$60 + y + 70 = 180 \quad \text{Angle Addition Postulate}$$
$$y + 130 = 180 \quad \text{Combine like terms.}$$
$$y = 50 \quad \text{Subtract 130 from each side.}$$

Click ***NEXT*** to continue.

Example 2 (continued)



Continue using your knowledge of angle relationships to find *x*. One strategy is to focus your attention on the 70° angle and the angle with a measure of *x*°. It may also help to disregard the ray that intersects the parallel lines.

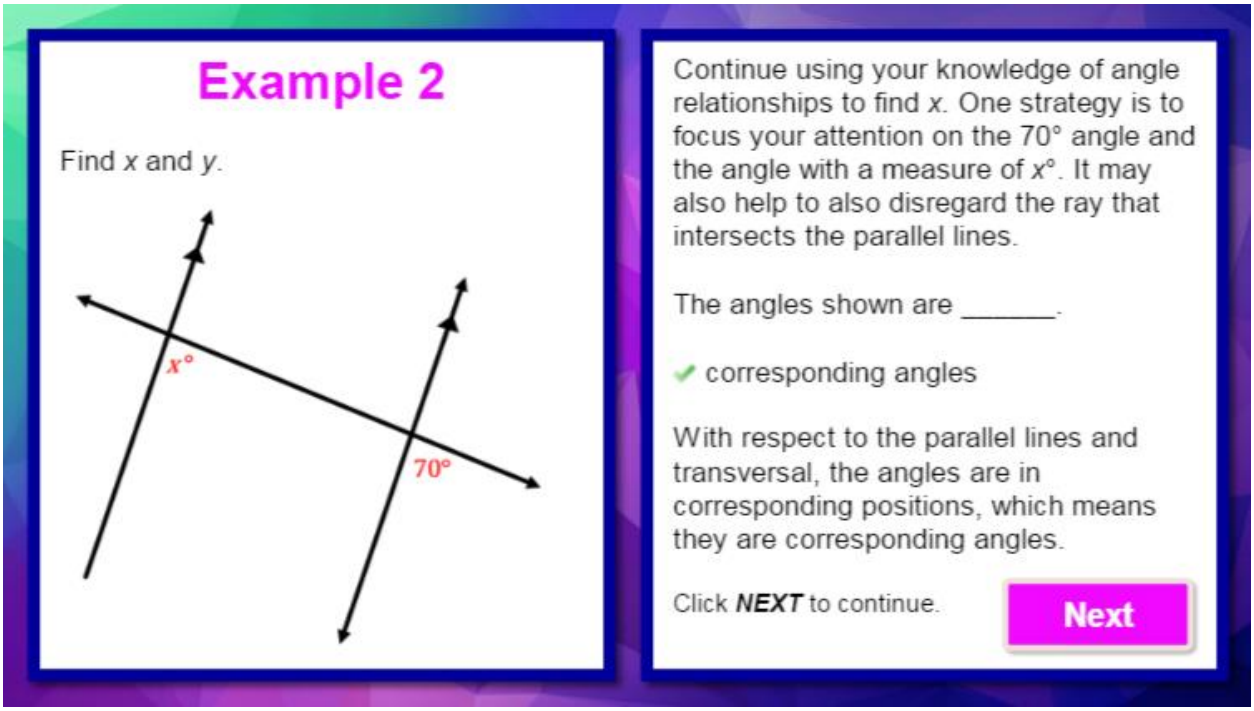


The angles shown are _____.

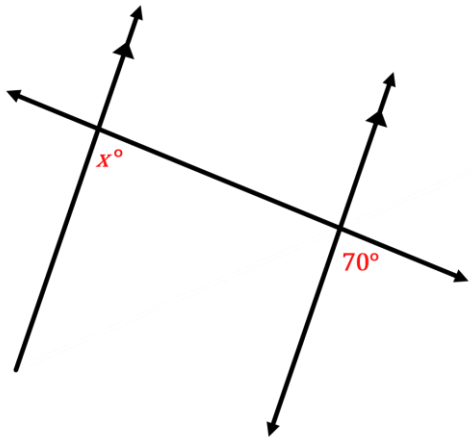
same-side exterior angles
alternate interior angles
corresponding angles

Select the correct answer and click ***SUBMIT*** to check your response.

Example 2 (continued)



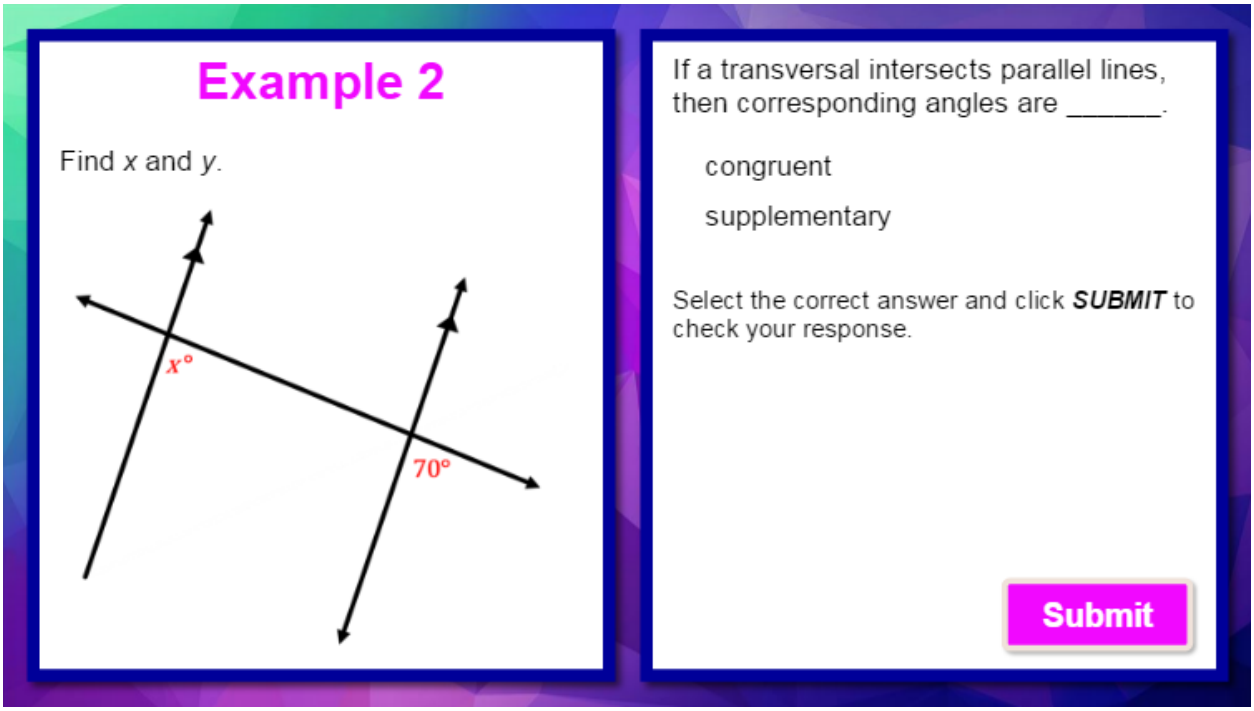
The correct answer is *corresponding angles*. The angles shown are corresponding angles.



With respect to the parallel lines and transversal, the angles are in corresponding positions, which means they are corresponding angles.

Click ***NEXT*** to continue.

Example 2 (continued)

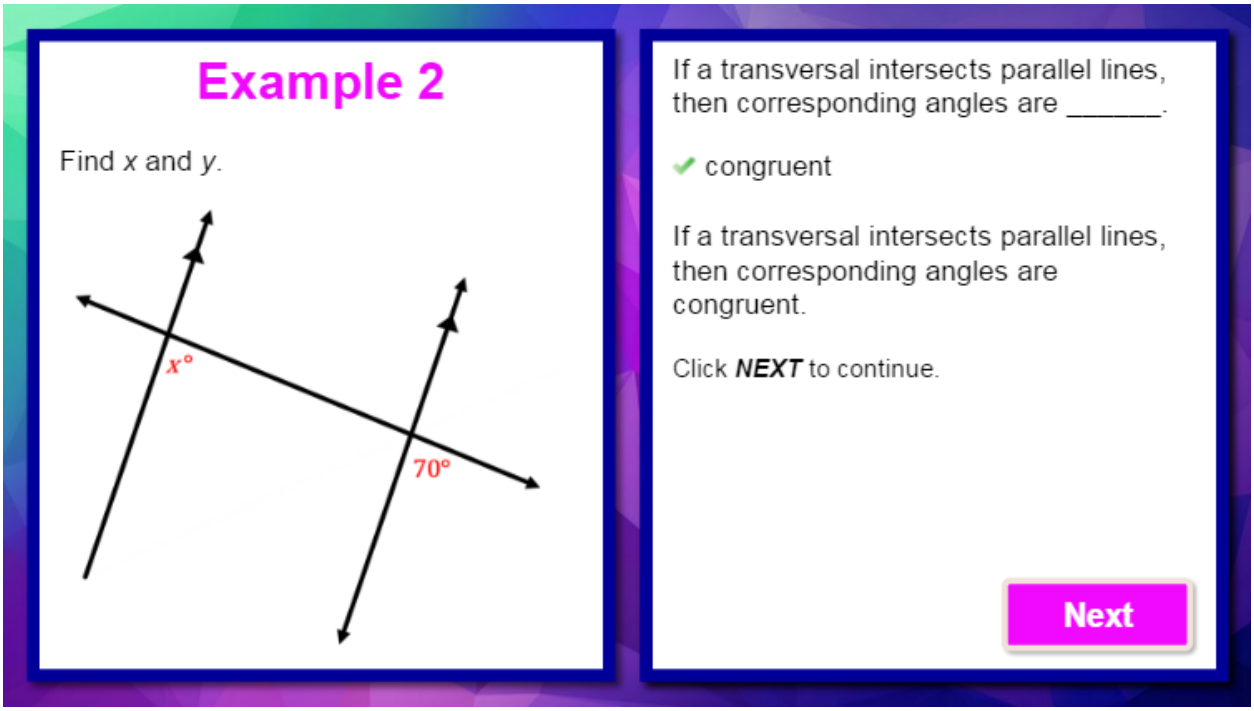


If a transversal intersects parallel lines, then corresponding angles are _____.

congruent
supplementary

Select the correct answer and click ***SUBMIT*** to check your response.

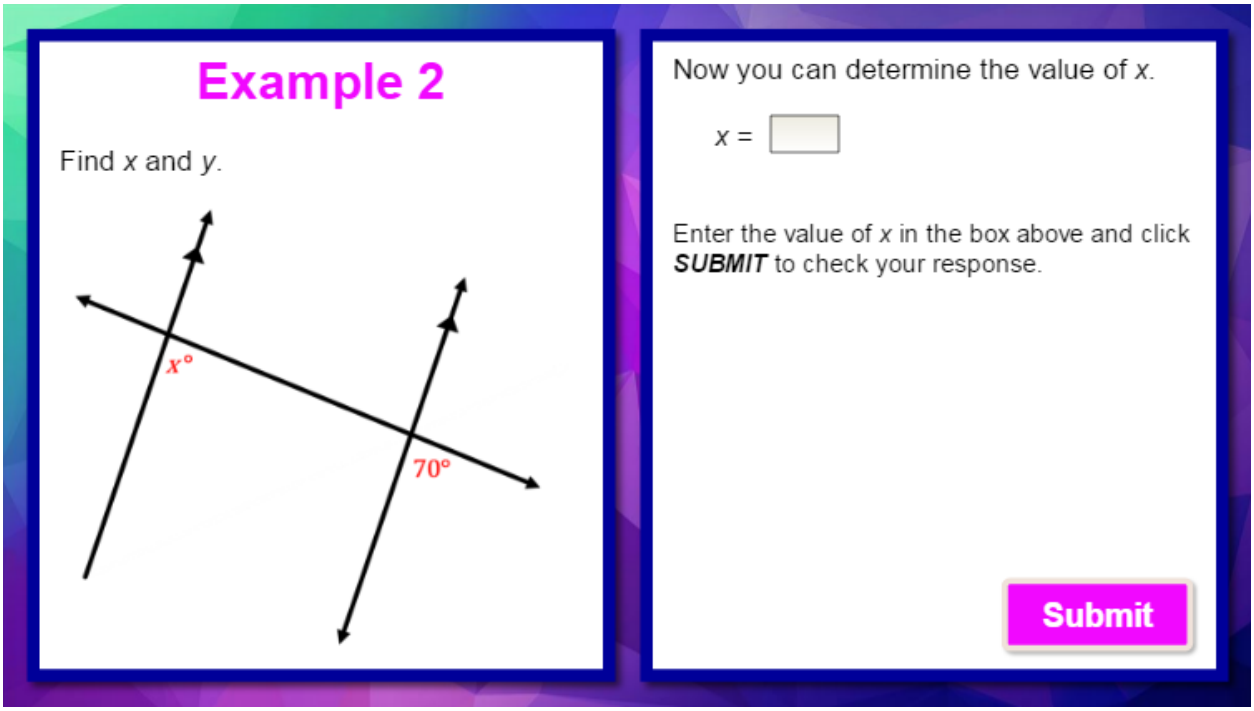
Example 2 (continued)



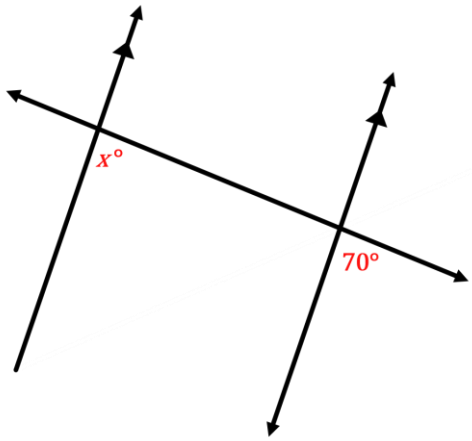
The correct answer is *congruent*. If a transversal intersects parallel lines, then corresponding angles are congruent.

Click ***NEXT*** to continue.

Example 2 (continued)



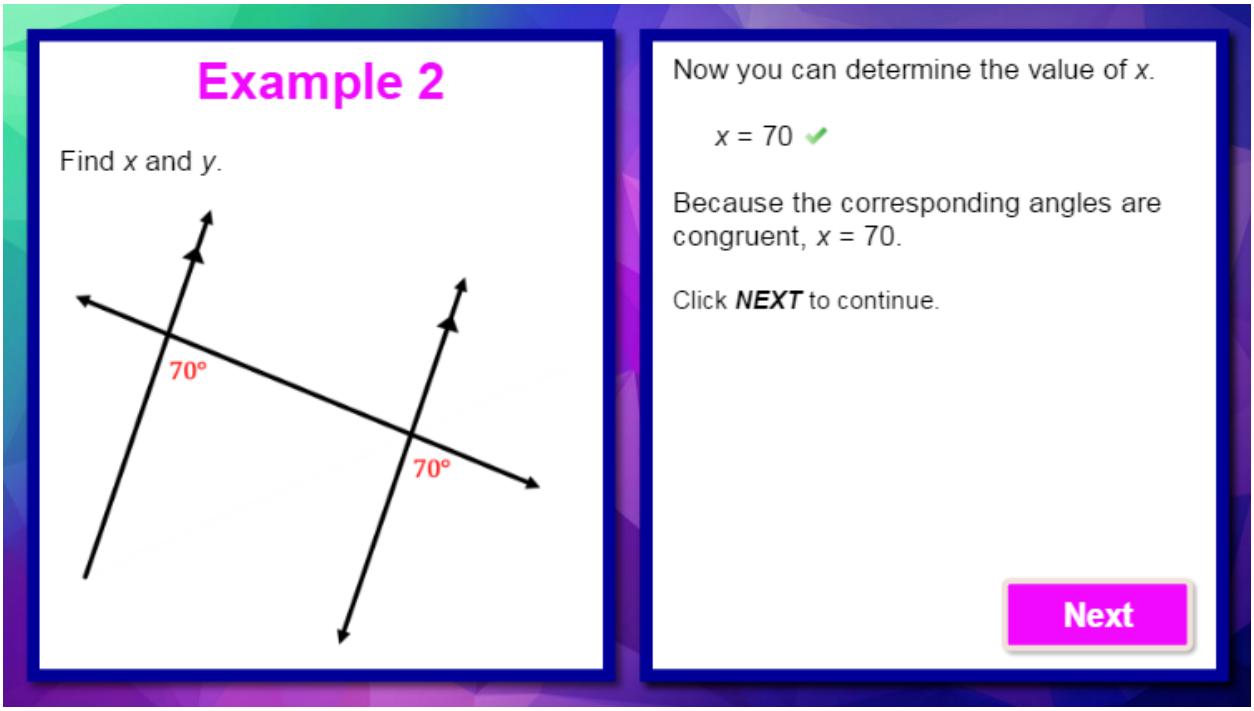
Now you can determine the value of x.



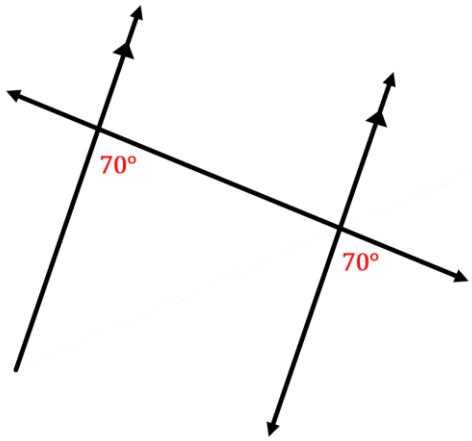
$x =$ _____

Enter the value of x in the box above and click ***SUBMIT*** to check your response.

Example 2 (continued)

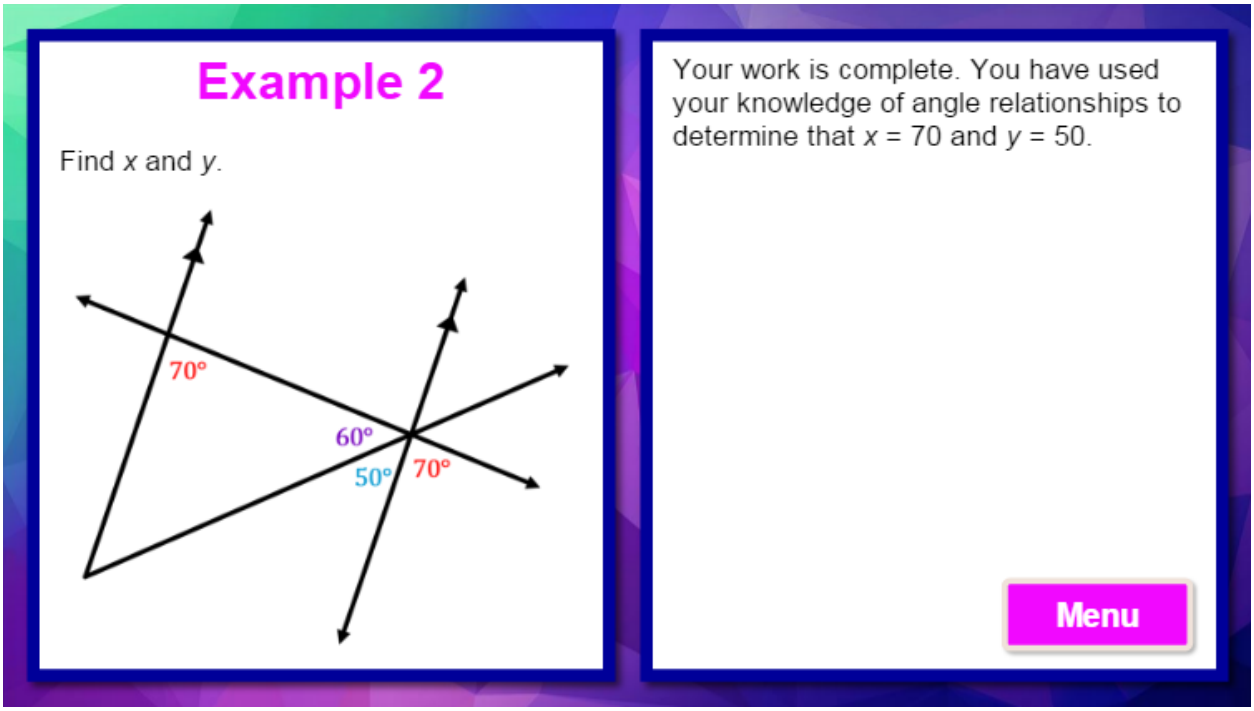


The correct answer is 70. Because the corresponding angles are congruent, $x = 70$.

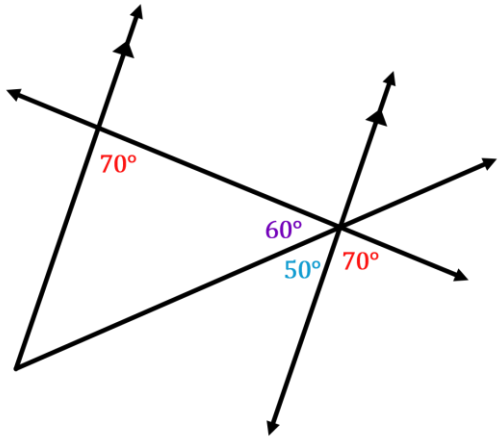


Click ***NEXT*** to continue.

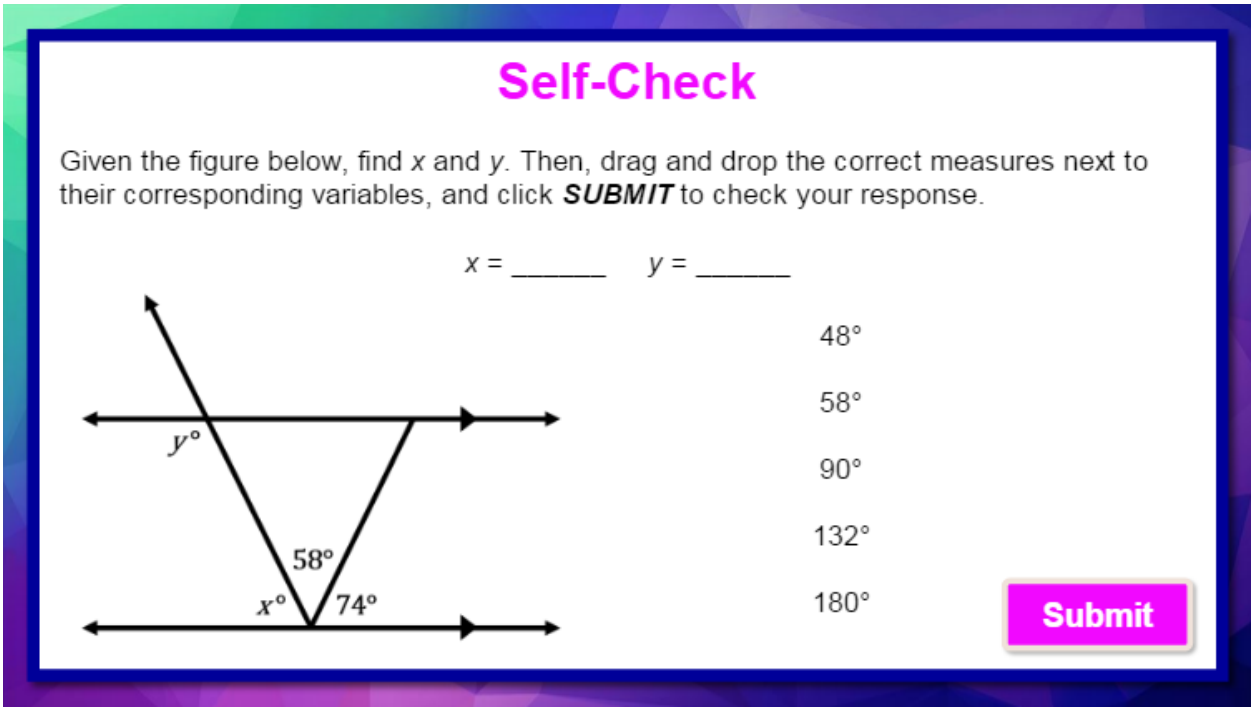
Example 2 (continued)



Your work is complete. You have used your knowledge of angle relationships to determine that $x = 70$ and $y = 50$.

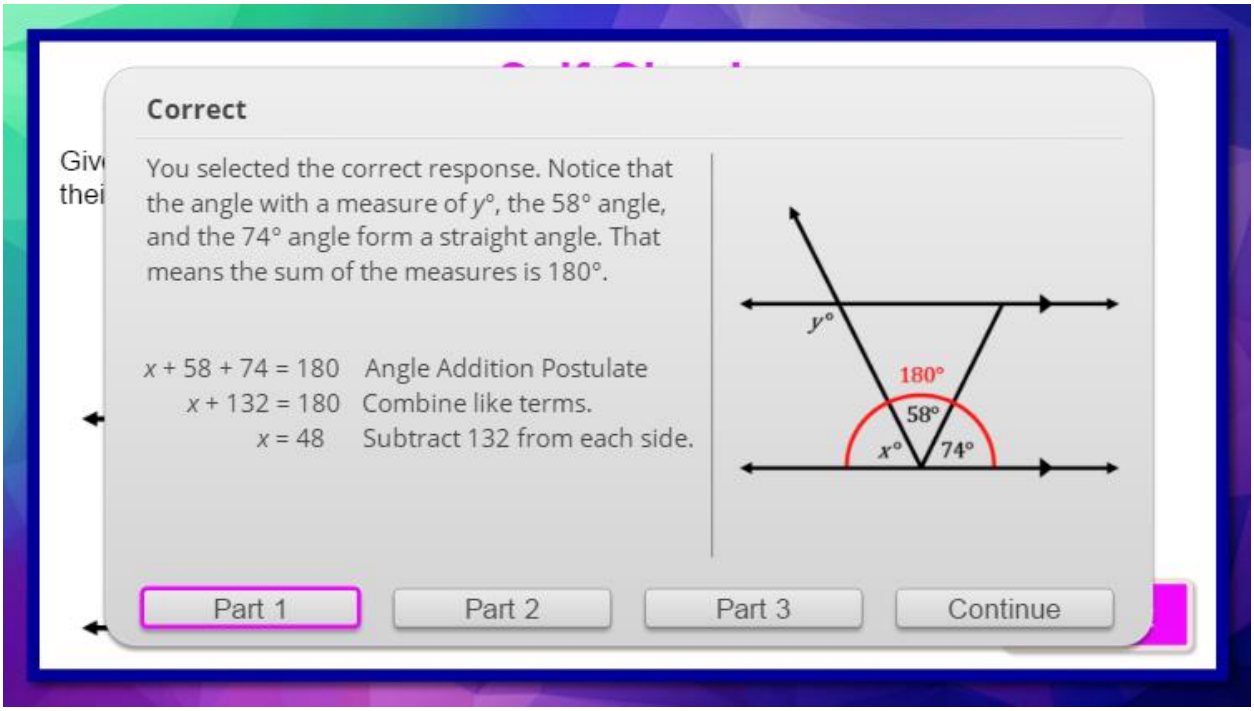


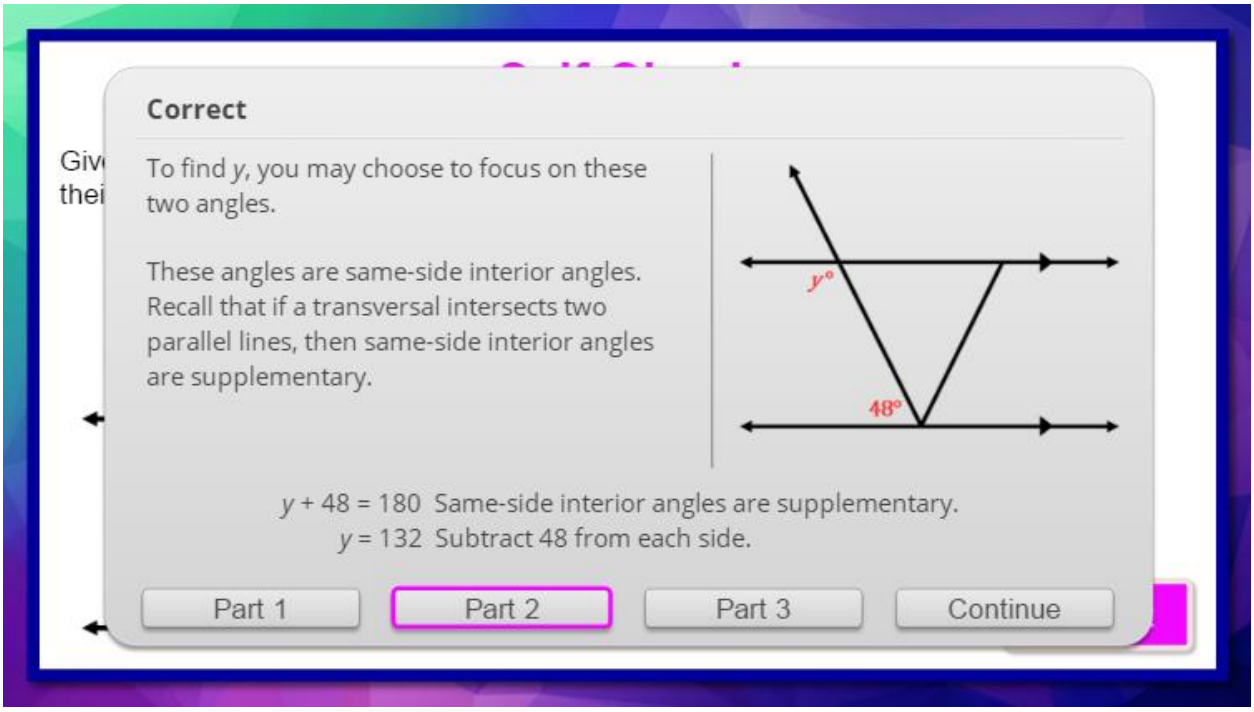
Self-Check



Solve the problem in the image above to check your understanding of the content.

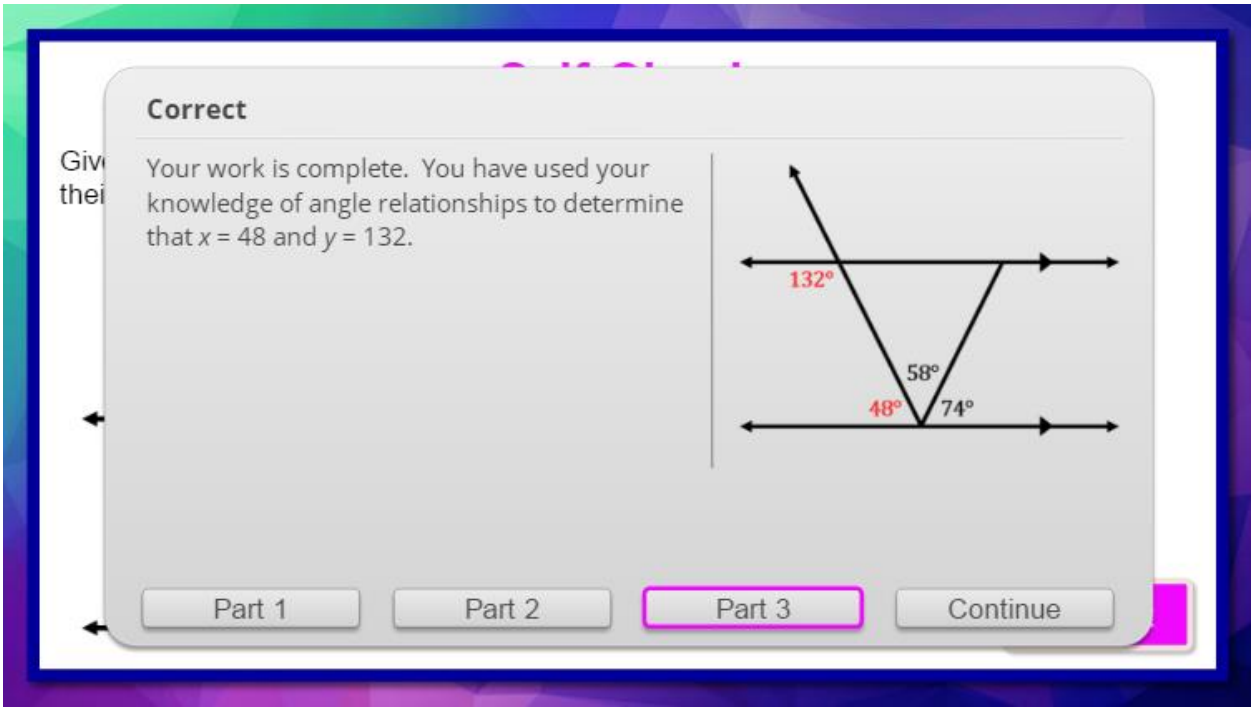
Self-Check: Answer





For your reference, the images above show the correct solution to the self-check problem.

Self-Check: Answer (continued)



For your reference, the image above shows the correct solution to the self-check problem.