

Name _____

Problem Solving • Unknown Angle Measures

Essential Question How can you use the strategy *draw a diagram* to solve angle measurement problems?

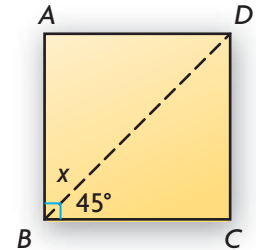


Measurement and Data—
4.MD.C.7

MATHEMATICAL PRACTICES
MP1, MP4

Unlock the Problem

Mr. Tran is cutting a piece of kitchen tile as shown at the right. He needs tiles with 45° angles to make a design. After the cut, what is the angle measure of the part left over? Can Mr. Tran use both pieces in the design?



Use the graphic organizer below to solve the problem.

Read the Problem

What do I need to find?

I need to find

What information do I need to use?

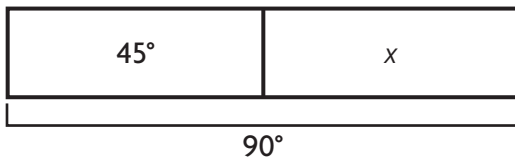
I can use the measures of the angles I know.

How will I use the information?

I can draw a bar model and use the information to

Solve the Problem

I can draw a bar model to represent the problem. Then I can write an equation to solve the problem.



$$m\angle ABD + m\angle CBD = m\angle ABC$$

$$x + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$x = \underline{\hspace{2cm}}$$

The $m\angle ABD = \underline{\hspace{2cm}}$.

Since both tiles measure $\underline{\hspace{2cm}}$, Mr. Tran can use both pieces in the design.

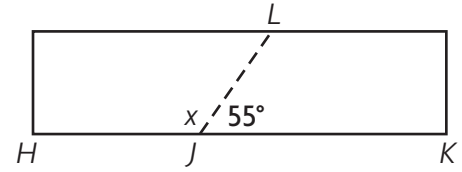


MATHEMATICAL PRACTICES 4

Write an Equation What other equation can you write to solve the problem? Explain.

Try Another Problem

Marisol is building a frame for a sandbox, but the boards she has are too short. She must join two boards together to build a side as shown. At what angle did she cut the first board?



Read the Problem

What do I need to find?

What information do I need to use?

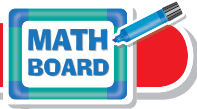
How will I use the information?

Solve the Problem

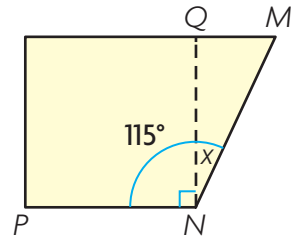
- Explain how you can check the answer to the problem.

Name _____

Share and Show



1. Laura cuts a square out of scrap paper as shown. What is the angle measure of the piece left over?
First, draw a bar model to represent the problem.



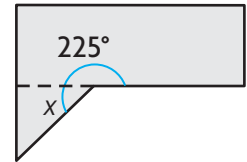
Next, write the equation you need to solve.

Last, find the angle measure of the piece left over.

$m\angle MNQ =$ _____

So, the angle measure of the piece left over is _____.

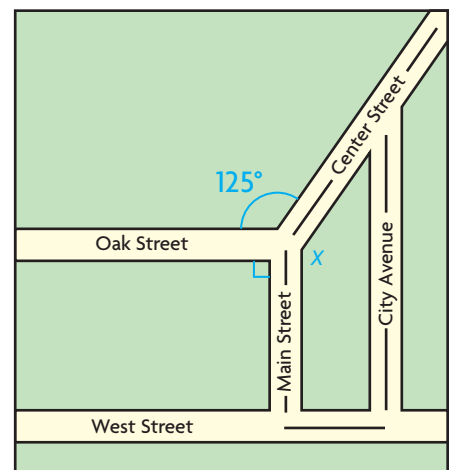
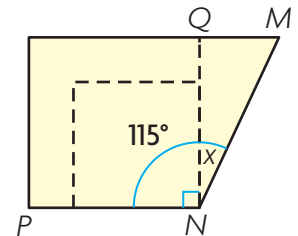
2. Jackie trimmed a piece of scrap metal to make a straight edge as shown. What is the measure of the piece she trimmed off?



On Your Own

3. **THINK SMARTER** What if Laura cut a smaller square as shown? Would $m\angle MNQ$ be different? Explain.

4. **GO DEEPER** The map shows Marco's paper route. When Marco turns right onto Center Street from Main Street, what degree turn does he make? **Hint:** Draw a dashed line to extend Oak Street to form a 180° angle.



Problem Solving • Applications

5. **MATHEMATICAL PRACTICE 4 Write an Equation** Two angles form a straight angle. One angle measures 89° . What is the measure of the other angle? Explain.

6. **Pose a Problem** Look back at Problem 5. Write a similar problem about two angles that form a right angle.

7. **GO DEEPER** Sam paid \$20 for two T-shirts. The price of each T-shirt was a multiple of 5. What are the possible prices of the T-shirts?

8. **GO DEEPER** Zayna has 3 boxes with 15 art books in each box. She has 2 bags with 11 math books in each bag. If she gives 30 books away, how many art and math books does she have left?

9. **What's the Question?** It measures greater than 0° and less than 90° .

10. **THINK SMARTER** Two angles, $\angle A$ and $\angle B$, form a straight angle. $\angle A$ measures 65° . For numbers 10a–10c, select True or False for the statement.

- | | | |
|--|----------------------------|-----------------------------|
| 10a. $\angle B$ is an acute angle. | <input type="radio"/> True | <input type="radio"/> False |
| 10b. The equation $180^\circ - 65^\circ = x^\circ$ can be used to find the measure of $\angle B$. | <input type="radio"/> True | <input type="radio"/> False |
| 10c. The measure of $\angle B$ is 125° . | <input type="radio"/> True | <input type="radio"/> False |

WRITE *Math* • Show Your Work

Name _____

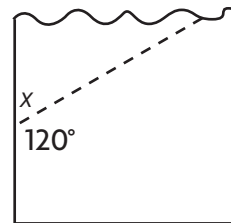
Problem Solving • Unknown Angle Measures



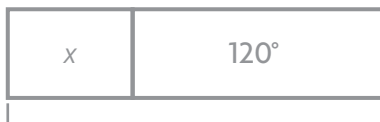
COMMON CORE STANDARD—4.MD.C.7
Geometric measurement: understand concepts of angle and measure angles.

Solve each problem. Draw a diagram to help.

1. Wayne is building a birdhouse. He is cutting a board as shown. What is the angle measure of the piece left over?



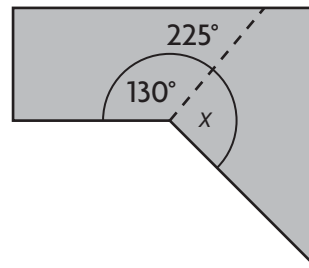
Draw a bar model to represent the problem.



$$\begin{aligned} x + 120^\circ &= 180^\circ \\ x &= 180^\circ - 120^\circ \\ x &= 60^\circ \end{aligned}$$

60°

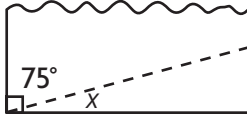
2. An artist is cutting a piece of metal as shown. What is the angle measure of the piece left over?



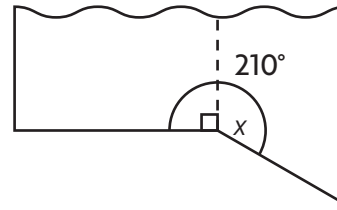
3. **WRITE** *Math* Give one example of when you would draw a diagram to solve an angle measurement problem.

Lesson Check (4.MD.C.7)

1. Angelo cuts a triangle from a sheet of paper as shown. What is the measure of $\angle x$ in the triangle?



2. Cindy cuts a piece of wood as shown. What is the angle measure of the piece left over?



Spiral Review (4.OA.A.3, 4.NF.A.2, 4.NF.C.6, 4.MD.C.7)

3. Tyrone worked 21 days last month. He earned \$79 each day. How much did Tyrone earn last month?

4. Meg inline skated for $\frac{7}{10}$ mile. Write this distance as a decimal.

5. Kerry ran $\frac{3}{4}$ mile. Sherrie ran $\frac{1}{2}$ mile. Marcie ran $\frac{2}{3}$ mile. List the friends in order from who ran the least distance to who ran the greatest distance.

6. What is the measure of $\angle ABC$?

