

Angle Connection Quest

Use angle relationships to find missing measures.

GRADE 8 • 8.MG.1.b

8.MG.1.b "Use the relationships among supplementary, complementary, vertical, and adjacent angles to solve problems, including those in context, involving the measure of unknown angles."

NAME _____

DATE _____

ANGLE RELATIONSHIPS

Complementary angles add to 90 degrees, and supplementary angles add to 180 degrees. Vertical angles are equal, and adjacent angles share a vertex and one side. Adjacent angles that make a straight line are supplementary.

WORKED EXAMPLE

Two adjacent angles form a straight line. One angle measures 47 degrees. Find the other angle.

1. A straight line measures 180 degrees.
2. Subtract the known angle: $180 - 47 = 133$.
3. The missing angle measures 133 degrees.

Answer: 133 degrees

PRACTICE 6 problems

- 1** Two angles are complementary. One angle measures 38 degrees. Find the other angle.

ANSWER _____

- 2** Two angles are supplementary. One angle measures 124 degrees. Find the other angle.

ANSWER _____

- 3** Two lines intersect. One angle measures 71 degrees. What is the measure of its vertical angle?

ANSWER _____

- 4** Two adjacent angles form a straight line. Their measures are $(x + 9)$ degrees and $2x$ degrees. Find x .

ANSWER _____

- 5** Two adjacent angles form a straight line. Their measures are $(x + 18)$ degrees and $3x$ degrees. Find x .

ANSWER _____

- 6** Two lines intersect. A pair of vertical angles measure $5x$ degrees and $(x + 48)$ degrees. Find x .

ANSWER _____

APPLY IT Show your work

- 1** At a skate park, two painted ramp lines cross. One of the angles where the lines cross measures 108 degrees. What is the measure of each angle adjacent to the 108-degree angle?

WORK SPACE

ANSWER _____

- 2** Two stage-light beams cross during a school concert. One angle formed by the beams measures 67 degrees. What is the measure of the vertical angle across from it?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Three adjacent angles lie on the same side of a straight line. Their measures are $(x + 20)$ degrees, $(2x - 10)$ degrees, and $(x + 30)$ degrees. Find x and the measure of each angle.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Two angles are complementary. One angle measures 38 degrees. Find the other angle.	52 degrees
2	Two angles are supplementary. One angle measures 124 degrees. Find the other angle.	56 degrees
3	Two lines intersect. One angle measures 71 degrees. What is the measure of its vertical angle?	71 degrees
4	Two adjacent angles form a straight line. Their measures are $(x + 9)$ degrees and $2x$ degrees. Find x .	$x = 57$
5	Two adjacent angles form a straight line. Their measures are $(x + 18)$ degrees and $3x$ degrees. Find x .	$x = 40.5$
6	Two lines intersect. A pair of vertical angles measure $5x$ degrees and $(x + 48)$ degrees. Find x .	$x = 12$

PART 2 • APPLY IT

- 72 degrees each** Each adjacent angle forms a straight line with the 108-degree angle. Compute $180 - 108 = 72$.
- 67 degrees** Vertical angles have equal measures. The angle across from 67 degrees also measures 67 degrees.

CHALLENGE

$x = 35$; the angles measure 55 degrees, 60 degrees, and 65 degrees

Accept 40.5 or $81/2$ for Problem 5. For the challenge, accept the angle measures in any order if students clearly match them to the expressions.