LESSON MAKER PRO

Angle Connection Lab

Spot angle relationships and use them to find missing measures.

GRADE 8 · 8.MG.1.a

8.MG.1.a "Identify and describe the relationship between pairs of angles that are vertical, adjacent, supplementary, and complementary."

NAME _____ DATE _____

ANGLE RELATIONSHIP RULES

Vertical angles are opposite angles made by two intersecting lines, and they have equal measures. Adjacent angles share a vertex and one side without overlapping. Supplementary angles add to 180 degrees, and complementary angles add to 90 degrees. A pair can be both adjacent and supplementary.

WORKED EXAMPLE

Two lines intersect. One angle measures 41 degrees. What is the measure of its vertical angle?

1. Vertical angles are opposite angles formed by intersecting lines.
2. Vertical angles have equal measures.
3. The vertical angle measures 41 degrees.

Answer: 41 degrees

PRACTICE 6 problems

1 Angles AOB and BOC share vertex O and side OB. Their interiors do not overlap. What is their relationship?

ANSWER _____

2 Two lines intersect. Angle 1 and angle 3 are opposite angles. Angle 1 measures 68 degrees, and angle 3 measures x degrees. Name their relationship and find x.

ANSWER _____

3 Two adjacent angles form a straight line. Their measures are (2x + 10) degrees and (4x - 4) degrees. Name their relationship and find x.

ANSWER _____

4 Two adjacent angles together make a right angle. One angle measures 37 degrees, and the other measures x degrees. Name their relationship and find x.

ANSWER _____

5 Two angles share a vertex and a side without overlapping. Their measures are 54 degrees and 126 degrees. Name every relationship that applies.

ANSWER _____

6 Two lines intersect. A pair of vertical angles measure (5x - 7) degrees and (3x + 25) degrees. Find x and the measure of each angle.

ANSWER _____

APPLY IT Show your work

1 At a skate park, two straight painted routes cross. One angle between the routes measures 72 degrees. What is the measure of the angle directly across from it, and what relationship do the two angles have?

WORK SPACE

ANSWER _____

2 At a concert, two light beams extend in opposite directions from point P, making a straight line. A third beam from P splits the straight angle into two adjacent angles measuring 117 degrees and 63 degrees. Name every relationship that applies to the 117-degree and 63-degree angles.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Lines AC and BD intersect at O. Angle AOB measures (4x + 8) degrees, and angle BOC measures (2x + 16) degrees. Find x and the measures of angles AOB, BOC, COD, and DOA. Then name the relationship between angles AOB and BOC and between angles AOB and COD.

WORK SPACE AND ANSWER

ANSWER KEY

Angle Connection Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Angles AOB and BOC share vertex O and side OB. Their interiors do not overlap. What is their relationship?	**adjacent angles**
2	Two lines intersect. Angle 1 and angle 3 are opposite angles. Angle 1 measures 68 degrees, and angle 3 measures x degrees. Name their relationship and find x.	**vertical angles; x = 68**
3	Two adjacent angles form a straight line. Their measures are (2x + 10) degrees and (4x - 4) degrees. Name their relationship and find x.	**supplementary angles; x = 29**
4	Two adjacent angles together make a right angle. One angle measures 37 degrees, and the other measures x degrees. Name their relationship and find x.	**complementary angles; x = 53**
5	Two angles share a vertex and a side without overlapping. Their measures are 54 degrees and 126 degrees. Name every relationship that applies.	**adjacent and supplementary**
6	Two lines intersect. A pair of vertical angles measure (5x - 7) degrees and (3x + 25) degrees. Find x and the measure of each angle.	**x = 16; each angle measures 73 degrees**

PART 2 · APPLY IT

1. **72 degrees; vertical angles** Angles directly across at an intersection are vertical angles. Vertical angles have equal measures, so the opposite angle is 72 degrees.
2. **adjacent and supplementary** The third beam creates two angles that share point P and one side, so they are adjacent. Their measures add to 180 degrees, so they are supplementary.

CHALLENGE

x = 26; angle AOB = 112 degrees, angle BOC = 68 degrees, angle COD = 112 degrees, angle DOA = 68 degrees; AOB and BOC are adjacent and supplementary, and AOB and COD are vertical angles.

Accept equivalent wording such as "linear pair" for adjacent supplementary angles. For relationship questions, students should name all relationships that apply when the prompt asks for every relationship.