

# Angle Match-Up

Use arc marks to match angles in similar figures.

GRADE 7 • 7.MG.2.a

**7.MG.2.a** "Identify corresponding congruent angles of similar quadrilaterals and triangles, through the use of geometric markings."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## MATCH THE MARKS

In similar figures, angles with matching arc marks are corresponding and congruent. Match one-arc angles to one-arc angles, two-arc angles to two-arc angles, and so on.

## WORKED EXAMPLE

Similar triangles ABC and DEF have one arc on  $\angle A$  and  $\angle D$ . If  $m\angle A = 52^\circ$ , find  $m\angle D$ .

- $\angle A$  and  $\angle D$  have matching one-arc marks.
- Matching angles are congruent.
- $m\angle D = m\angle A = 52^\circ$ .

**Answer:  $52^\circ$**

## PRACTICE 5 problems

- 1** Similar triangles GHI and JKL have one arc on  $\angle G$  and  $\angle J$ . If  $m\angle G = 38^\circ$ , find  $m\angle J$ .

**ANSWER** \_\_\_\_\_

- 2** Similar quadrilaterals MNOP and QRST have two arcs on  $\angle N$  and  $\angle R$ . Which angle corresponds to  $\angle N$ ?

**ANSWER** \_\_\_\_\_

- 3** Similar triangles UVW and XYZ have three arcs on  $\angle V$  and  $\angle Z$ . If  $m\angle Z = 104^\circ$ , find  $m\angle V$ .

**ANSWER** \_\_\_\_\_

- 4** Similar quadrilaterals ABCD and EFGH have one arc on  $\angle B$  and  $\angle F$ , and two arcs on  $\angle C$  and  $\angle G$ . Name both matching pairs.

**ANSWER** \_\_\_\_\_

- 5** Similar triangles LMN and PQR have one arc on  $\angle L$  and  $\angle Q$ , two arcs on  $\angle M$  and  $\angle P$ , and no arc on  $\angle N$  and  $\angle R$ . If  $m\angle N = 29^\circ$ , find  $m\angle R$ .

**ANSWER** \_\_\_\_\_

## APPLY IT Show your work

- 1** Two similar triangular esports pennants have double-arc marks at their top angles. The small pennant's top angle measures  $63^\circ$ . What is the large pennant's top angle?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** Two similar quadrilateral skateboard-deck logos have one-arc marks at matching corners. One marked corner measures  $117^\circ$ . What is the measure of the other marked corner?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

Similar quadrilaterals WXYZ and KLMN have these marks:  $\angle W$  and  $\angle M$  have one arc,  $\angle X$  and  $\angle L$  have two arcs,  $\angle Y$  and  $\angle K$  have three arcs, and  $\angle Z$  and  $\angle N$  have no arc. Write the vertices of KLMN in the order that matches WXYZ. Then, if  $m\angle N = 86^\circ$ , find  $m\angle Z$ . Explain.

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                                                                                                                                    | ANSWER                                                                               |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1 | Similar triangles GHI and JKL have one arc on $\angle G$ and $\angle J$ . If $m\angle G = 38^\circ$ , find $m\angle J$ .                                                                                   | <b><math>38^\circ</math></b>                                                         |
| 2 | Similar quadrilaterals MNOP and QRST have two arcs on $\angle N$ and $\angle R$ . Which angle corresponds to $\angle N$ ?                                                                                  | <b><math>\angle R</math></b>                                                         |
| 3 | Similar triangles UVW and XYZ have three arcs on $\angle V$ and $\angle Z$ . If $m\angle Z = 104^\circ$ , find $m\angle V$ .                                                                               | <b><math>104^\circ</math></b>                                                        |
| 4 | Similar quadrilaterals ABCD and EFGH have one arc on $\angle B$ and $\angle F$ , and two arcs on $\angle C$ and $\angle G$ . Name both matching pairs.                                                     | <b><math>\angle B \cong \angle F</math> and <math>\angle C \cong \angle G</math></b> |
| 5 | Similar triangles LMN and PQR have one arc on $\angle L$ and $\angle Q$ , two arcs on $\angle M$ and $\angle P$ , and no arc on $\angle N$ and $\angle R$ . If $m\angle N = 29^\circ$ , find $m\angle R$ . | <b><math>29^\circ</math></b>                                                         |

## PART 2 • APPLY IT

- $63^\circ$**  The double-arc angles correspond, so they are congruent.
- $117^\circ$**  The one-arc angles correspond, so they have equal measures.

## CHALLENGE

**MLKN;  $m\angle Z = 86^\circ$ . The matching marks pair W with M, X with L, Y with K, and Z with N.**

Accept equivalent angle-congruence notation. Students may write angle measures with or without the degree symbol if the value is correct.