

Angle Measure Mission

Track angle measures through rigid transformations.

GRADE 8 • 8.G.A.1b

CCSS.Math.Content.8.G.A.1b "Angles are taken to angles of the same measure."

NAME _____

DATE _____

THE BIG IDEA

A rotation, reflection, or translation can move an angle, but it does not change the angle's measure. The image angle has the same measure as the original angle, even if it points in a different direction.

WORKED EXAMPLE

Angle ABC measures 41° . A rotation turns the figure 135° and maps angle ABC to angle A'B'C'. What is $m\angle A'B'C'$?

1. A rotation preserves angle measure.
2. $m\angle A'B'C' = m\angle ABC$.
3. $m\angle A'B'C' = 41^\circ$.

Answer: 41°

PRACTICE 6 problems

- 1** Angle PQR measures 68° . It is reflected across a line. What is the measure of its image angle?

ANSWER _____

- 2** Angle DEF measures $(2x + 14)^\circ$. A rotation maps it to an angle measuring 92° . Find x .

ANSWER _____

- 3** Angle GHI measures 115° . It is translated 6 units right. What is the measure of its image angle?

ANSWER _____

- 4** An angle measures 47° . It is reflected and then rotated. What is the measure of the final image angle?

ANSWER _____

- 5** Angle MNO measures $(3x - 6)^\circ$. Its translated image measures 75° . Find x .

ANSWER _____

- 6** Angle JKL is translated. Its image measures 128° . What was the measure of angle JKL before the translation?

ANSWER _____

APPLY IT Show your work

- 1** A student designs a skateboard logo with a 56° corner angle. The logo is rotated 270° for a sticker design. What is the measure of the matching corner angle on the sticker?

WORK SPACE

ANSWER _____

- 2** A game designer reflects a badge across a vertical line to make a mirror-image team icon. One angle on the original badge measures 124° . What is the measure of the matching angle on the reflected icon?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A triangle has angle measures 52° , 63° , and 65° . It is reflected and then translated. List the measures of the three matching image angles and explain why they stay the same.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Angle PQR measures 68° . It is reflected across a line. What is the measure of its image angle?	68°
2	Angle DEF measures $(2x + 14)^\circ$. A rotation maps it to an angle measuring 92° . Find x .	$x = 39$
3	Angle GHI measures 115° . It is translated 6 units right. What is the measure of its image angle?	115°
4	An angle measures 47° . It is reflected and then rotated. What is the measure of the final image angle?	47°
5	Angle MNO measures $(3x - 6)^\circ$. Its translated image measures 75° . Find x .	$x = 27$
6	Angle JKL is translated. Its image measures 128° . What was the measure of angle JKL before the translation?	128°

PART 2 • APPLY IT

1. **56°** A rotation preserves angle measure. The matching corner angle remains 56° .
2. **124°** A reflection preserves angle measure. The matching angle on the reflected badge measures 124° .

CHALLENGE

52° , 63° , and 65° . Reflections and translations preserve angle measure, so each image angle has the same measure as its original angle.

Accept degree symbols or the word degrees. For algebra items, accept the correct value of x with or without the label $x =$.