

Polygon Detectives

Check sides and angles to spot regular polygons.

GRADE 6 • 6.MG.4.a

6.MG.4.a "Identify regular polygons."

NAME _____

DATE _____

REGULAR OR NOT?

A regular polygon has sides that are all the same length and angles that are all the same size. Check both features, because matching sides alone or matching angles alone is not enough.

WORKED EXAMPLE

A polygon has 9 equal sides and 9 equal angles. Is it regular?

1. A regular polygon needs all sides to be equal.
2. It also needs all angles to be equal.
3. This polygon has both features.

Answer: Yes. It is a regular nonagon.

PRACTICE 6 problems

- 1** A pentagon has five sides of equal length. Its angle measures are 100° , 110° , 110° , 110° , and 110° . Is it regular?

ANSWER _____

- 2** A quadrilateral has four 90° angles. Its side lengths are 3 cm, 5 cm, 3 cm, and 5 cm. Is it regular?

ANSWER _____

- 3** A triangle has three sides that are each 7 cm long. Each interior angle measures 60° . Is it regular?

ANSWER _____

- 4** An octagon has 8 equal sides and 8 angles that each measure 135° . Is it regular?

ANSWER _____

- 5** A heptagon has seven equal angles, but one side is longer than the other sides. Is it regular?

ANSWER _____

- 6** Which statement must be true about every regular polygon? A. All sides are equal. B. All angles are equal. C. All sides and all angles are equal. D. It has four sides.

ANSWER _____

APPLY IT Show your work

- 1** At a game club, a designer makes a 12-sided score token. Each side is 2 cm long, and every interior angle is 150° . Can the token be called a regular polygon? Name it.

WORK SPACE

ANSWER _____

- 2** A robotics team makes a 6-sided logo frame. All six side lengths match, but one corner angle is wider than the other corner angles. Is the frame a regular polygon?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An 8-sided badge has 8 equal sides. Seven interior angles measure 135° . The interior angles of the badge total 1080° . The remaining angle measures x° . Find x . Is the badge regular? Explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A pentagon has five sides of equal length. Its angle measures are 100° , 110° , 110° , 110° , and 110° . Is it regular?	No. Its angles are not all equal.
2	A quadrilateral has four 90° angles. Its side lengths are 3 cm, 5 cm, 3 cm, and 5 cm. Is it regular?	No. Its sides are not all equal.
3	A triangle has three sides that are each 7 cm long. Each interior angle measures 60° . Is it regular?	Yes. All sides and all angles are equal.
4	An octagon has 8 equal sides and 8 angles that each measure 135° . Is it regular?	Yes. All sides and all angles are equal.
5	A heptagon has seven equal angles, but one side is longer than the other sides. Is it regular?	No. Its sides are not all equal.
6	Which statement must be true about every regular polygon? A. All sides are equal. B. All angles are equal. C. All sides and all angles are equal. D. It has four sides.	C. All sides and all angles are equal.

PART 2 • APPLY IT

- Yes. It is a regular dodecagon.** All of the token's sides have equal length, and all of its angles have equal measure. A 12-sided polygon is called a dodecagon.
- No. One angle is different, so the frame is not regular.** A regular polygon must have equal angles as well as equal sides. The different corner angle means the frame is not regular.

CHALLENGE

$x = 135^\circ$. Yes, the badge is regular because all 8 sides are equal and all 8 angles measure 135° .

Accept "regular" or "not regular" when the student gives the correct side or angle reason. For the challenge, accept equivalent wording that states x is 135° and identifies both equal sides and equal angles.