

Tessellations (pages 388–391)

A **tessellation** is a repetitive pattern of regular polygons that fit together with no overlaps or gaps. In a tessellation, the sum of the measures of the angles where the vertices of the polygons meet is 360° .

EXAMPLE

The sum of the measures of the angles of an equilateral triangle is 180° . Can an equilateral triangle make a tessellation?

Each angle of an equilateral triangle has a measure of $180 \div 3$ or 60° . To find out if an equilateral triangle tessellates, solve $60n = 360$, where n is the number of angles at a vertex.

$$\frac{60n}{60} = \frac{360}{60} \quad \text{Divide each side by 60.}$$

$$n = 6$$

The solution is a whole number, so an equilateral triangle will make a tessellation.

Try These Together

Determine whether each polygon can be used by itself to make a tessellation. The sum of the measures of the angles of each polygon is given.

1. octagon; $1,080^\circ$

2. hexagon; 720°

PRACTICE

Determine whether each polygon can be used by itself to make a tessellation. The sum of the measures of the angles of each polygon is given.

3. triangle; 180°

4. pentagon; 540°

Sketch the following tessellations.

5. triangles

6. octagons and squares

7. **Computers** Seth wants to make a tessellation to use for a background on a Web page. He would like to use two regular hexagons and one square to form each vertex. Will this work? Why or why not?



8. **Standardized Test Practice** Which one of the following cannot be used by itself to make a tessellation?

A a triangle

B a square

C a hexagon

D a nonagon

Answers: 1. no 2. yes 3. yes 4. no 5-6. See Answer Key. 7. No, the sum of the angles of two regular hexagons and one square is 330° , not 360° . 8. D