Area of Regular Polygons — Homework

Lesson 5-9 • Standard 6.GR.1

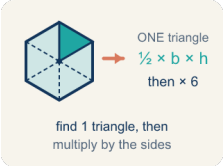
Name: _____ **Period:** _____ **Date:** _____

Today's Goals

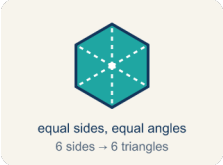
Content: I can find the area of a regular polygon by decomposing it into triangles.

Language: I can explain my steps using the words regular polygon, decompose, triangle, and composite.

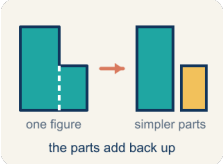
Key Words



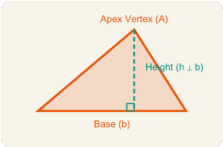
Area of Regular Polygons (Área de polígonos regulares) — The space a regular polygon covers. Split it from the center into identical triangles, find one triangle's area, then multiply by how many there are.



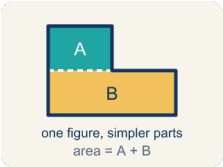
Regular Polygon (Polígono regular) — A closed flat shape made of straight sides, where every side is the same length and every angle is the same size.



Decompose (Descomponer) — To break a shape into smaller, simpler shapes.



Triangle (Triángulo) — A shape with three sides.



Composite (Compuesto) — Made by putting two or more simple shapes together.



Formula (Fórmula) — A math rule written with symbols.

Practice

Show your work. Use the blank space under each problem.

1. A regular hexagon is divided into 6 equal triangles from the center. Each triangle has a base of 6 ft and a height of 5.2 ft. What is the area of one triangle? Use the given heights; nonsquare heights are rounded, so their areas are estimates.

A. 11.2 sq ft
B. 15.6 sq ft
C. 15.6 ft
D. 31.2 sq ft

---

2. A regular hexagonal skylight has 6 central triangles, each with base 6 ft and rounded height 5.2 ft. Using those measurements, what is the approximate total area?

A. 15.6 sq ft
B. 62.4 sq ft
C. 93.6 sq ft
D. 187.2 sq ft

---

3. Complete the table.

Polygon	Number of Triangles	Triangle Base	Triangle Height	Area of One Triangle	Total Area
Hexagon	6	6 ft	5.2 ft		
Pentagon	5	8 ft	5.5 ft		
Square	4	5 ft	2.5 ft		
Octagon	8	4 ft	4.8 ft		

---

4. Match each polygon to its total area. Use the given heights; nonsquare heights are rounded, so their areas are estimates.

Item	Answer choices
____ Hexagon: 6 triangles, each ½×6×5.2	F. 7.2 sq ft
____ Pentagon: 5 triangles, each ½×8×5.5	E. 69 sq ft
____ Octagon: 8 triangles, each ½×4×4.8	D. 25 sq ft
____ Square: 4 triangles, each ½×5×2.5	C. 76.8 sq ft
____ Decagon: 10 triangles, each about ½×3×4.6	B. 110 sq ft
____ Equilateral triangle: 3 central triangles, each about ½×4×1.2	A. 93.6 sq ft

---

5. Find the TOTAL area of each regular polygon, then sort it against the 90 sq ft cutoff. Use the given heights; nonsquare heights are rounded, so their areas are estimates.

Groups: Total area ≥ 90 sq ft | Total area < 90 sq ft

- Pentagon: 5 triangles, base 8 ft, height 5.5 ft → _____
- Hexagon: 6 triangles, base 6 ft, height 5.2 ft → _____
- Octagon: 8 triangles, base 4 ft, height 4.8 ft → _____
- Square: 4 triangles, base 5 ft, height 2.5 ft → _____

---

6. Spot the Common Mistake (use rounded heights)

Step 1 (Decompose the pentagon): A regular pentagon = 5 congruent triangles
Step 2 (Identify one triangle): base = 6 ft, height = 4 ft
Step 3 (Find the area of one triangle): A = 6 × 4 = 24 sq ft
Step 4 (Find total area): Total area = 5 × 24 = 120 sq ft

Which step has the mistake? Explain and fix it:

7. A regular hexagonal floor tile splits from its center into 6 congruent triangles, each with an area of 12 cm². What is the total area of the tile?

A. 12 cm²
B. 18 cm²
C. 36 cm²
D. 72 cm²

---

8. A regular pentagonal tile splits into 5 congruent triangles. Each triangle has a base of 4 in and a height of about 2.8 in. What is the total area of the tile? Use the given heights; nonsquare heights are rounded, so their areas are estimates.

A. 5.6 in²
B. 11.2 in²
C. 28 in²
D. 56 in²

---

9. Each tile decomposes into congruent triangles from its center. Work out the area of ONE triangle, then sort the tile. Use the given heights; nonsquare heights are rounded, so their areas are estimates.

Groups: One triangle ≤ 12 sq ft | One triangle > 12 sq ft

- Square tile: base 4 ft, height 2 ft → _____
- Hexagon tile: base 4 ft, height ≈ 3.5 ft → _____
- Octagon tile: base 6 ft, height ≈ 7.2 ft → _____
- Pentagon tile: base 8 ft, height ≈ 5.5 ft → _____

---

10. Match each polygon tile to its total area. Use the given heights; nonsquare heights are rounded, so their areas are estimates.

Item	Answer choices
____ Square tile: 4 triangles, each ½×9×4.5	D. About 15.6 sq ft
____ Octagon tile: 8 triangles, each about ½×3×3.6	C. About 64.5 sq ft
____ Hexagon tile: 6 triangles, each about ½×5×4.3	B. About 43.2 sq ft
____ Equilateral triangle tile: 1 whole triangle, about ½×6×5.2	A. 81 sq ft

---