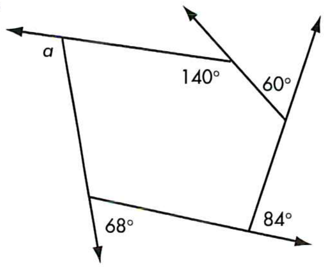
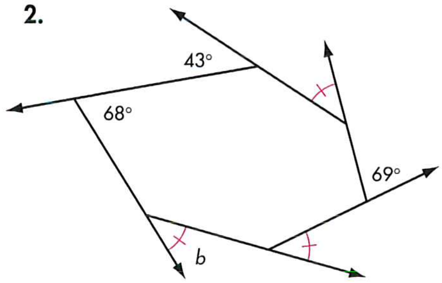
Exercise Set 6.2

In Exercises 1–6, use your conjectures to calculate each lettered angle measure.

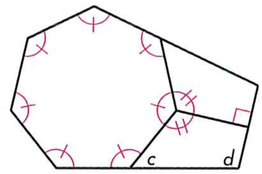
1.



2.



3.*



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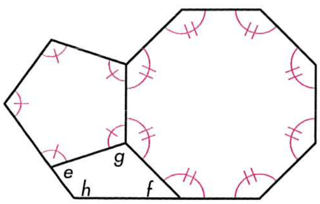

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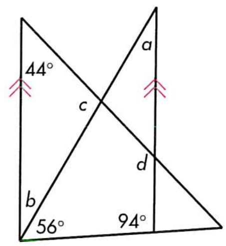
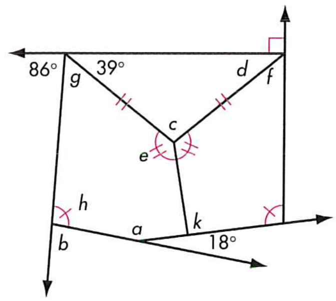
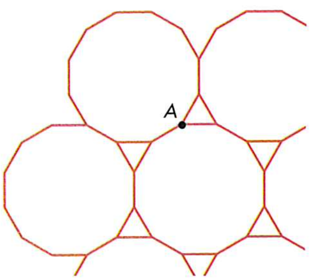


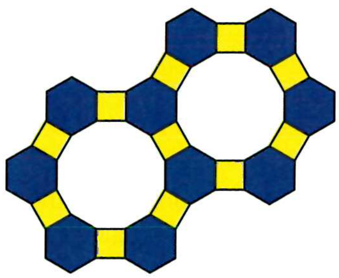
6.*



7. Name the regular polygons that appear in the tiling below. Find the measures of the angles that surround point A in the tiling.



8. Name the regular polygons that appear in the tiling below. Find the measures of the angles that surround any point in the tiling.



9. What is the sum of the measures of a set of exterior angles of a decagon?

10. Four exterior angles of a pentagon measure 63°, 67°, 58°, and 64°. What is the measure of the remaining exterior angle?

11.* What is the measure of each exterior angle of a regular hexagon?

12.* How many sides does a regular polygon have if each exterior angle measures 24°?

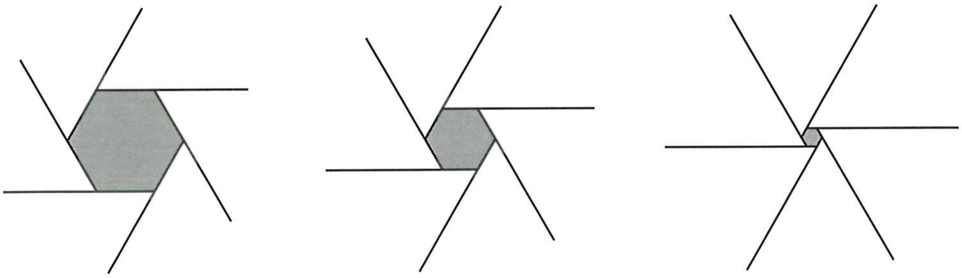
13. What is the sum of the measures of the interior angles of a dodecagon?

14. How many sides does a polygon have if the sum of its interior angle measures is 7380°?

15. What is the measure of each interior angle of a regular octagon?

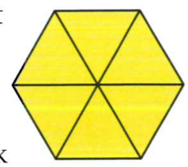
16.* How many sides does a regular polygon have if each of its interior angles measures 165°?

17. The **aperture** of a camera is the opening that limits the amount of light coming through the camera's lens. In many cameras, the aperture is shaped like a regular polygon surrounded by thin sheets that form a set of exterior angles. These sheets move together or apart to close or open the aperture. Explain how the sequence of closing apertures shown below demonstrates the Exterior Angle Sum Conjecture.

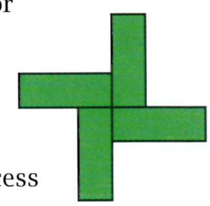


18.* Is there a maximum number of obtuse exterior angles that any polygon can have? If so, what is the maximum? If not, why not? Is there a minimum number of acute interior angles that any polygon can have?

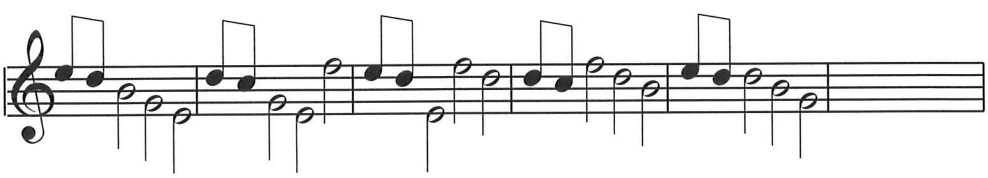
19. Six equilateral triangles can fit about a point ($6 \times 60^\circ = 360^\circ$) without gaps or overlaps. Can you do this with any triangle? Try it. Draw a triangle. Make five copies. Label the interiors of the three angles *a*, *b*, and *c* correspondingly in each triangle. Cut the triangles out. Try arranging them about a point. If you had more triangles, do you think you could continue this process to fill the page?



20. Four rectangles can fit about a point ($4 \times 90^\circ = 360^\circ$) without gaps or overlapping. Can you do this with any quadrilateral? Try it. Draw a quadrilateral. Make three copies. Label the interiors of the four angles *a*, *b*, *c*, and *d* correspondingly in each quadrilateral. Cut the quadrilaterals out. Try arranging them about a point. If you had more quadrilaterals, do you think you could continue this process to fill the page?



21.* Copy all five measures of the musical pattern shown. Assuming the pattern continues, draw in the location of all the notes in the next measure.



22. Draw a counterexample to show that the following statement is false: If a triangle is isosceles, then the base angles cannot be complementary.

23. Find the coordinates of three more points that lie on the line passing through the points (2, –1) and (–3, 4).