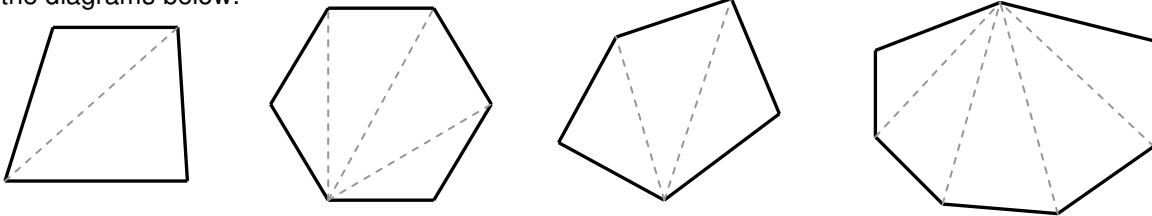


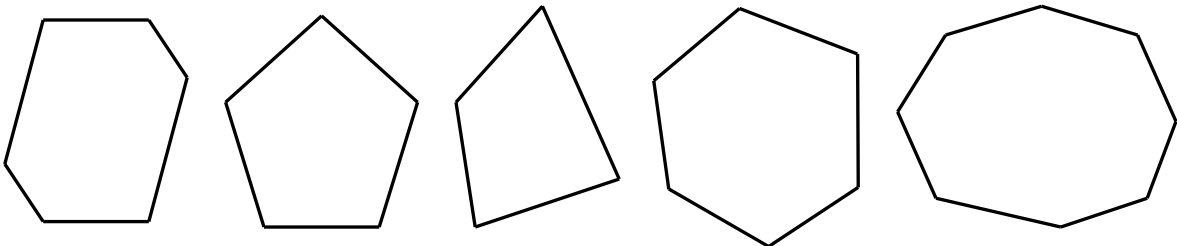
Interior Angle Sums: Classwork

Zack and Cody claim that they can calculate the interior angle sum of any polygon. They each have a different strategy, and used diagrams to illustrate their reasoning.

1. Zack divides polygons into triangles by drawing all the diagonals of the polygons from one vertex, as in the diagrams below:



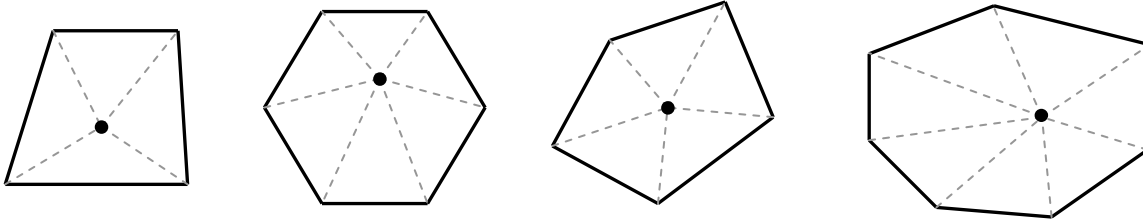
- a. Study Zack's drawings. How can you use Zack's method to find the interior angle sum of each polygon? Explain, then find the interior angle sum of each polygon.
- b. Use Zack's method to find the interior angle sum of each polygon. Show your work.



- c. **Time to generalize!** Look back at your work to complete the following table.

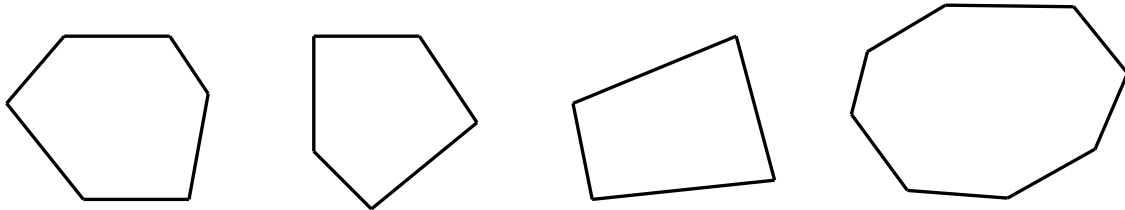
Number of Sides on Polygon	Number of Triangles inside	Interior Angle Sum
4 (quadrilateral)		
5 (pentagon)		
6 (hexagon)		
7 (heptagon)		
8 (octagon)		
n (any number of sides)		

2. Cody's method is a little more complicated. He starts by plotting a point anywhere inside the polygon. He then draws a line segment from the point to each vertex.



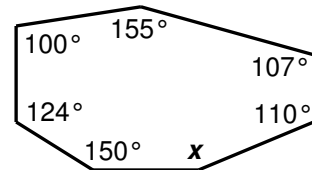
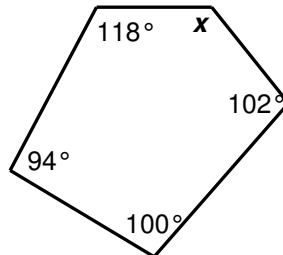
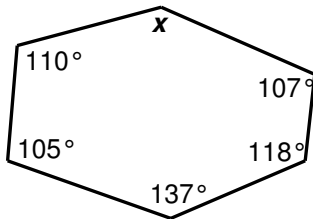
- a. Study Cody's drawings. How can you use Cody's method to find the interior angle sum of each polygon? *Hint: you will have to subtract the interior angles that are not part of the polygon!*

- b. Use Cody's method to find the interior angle sum of each polygon. Show your work.

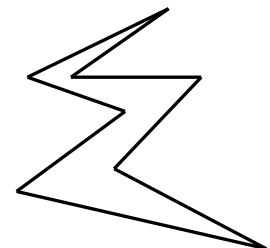


- c. **Time to generalize!** Based on Cody's method, write an equation for the interior angle sum of a polygon with n sides.

3. Use what you know about interior angle sums to find the measure of each angle labeled x .

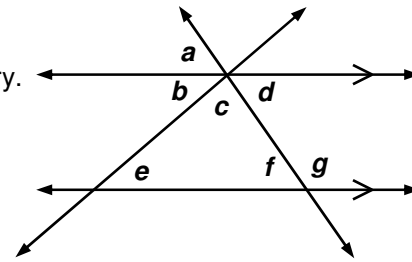


4. Look at the polygon on the right. Does Zack's method of finding the interior angle sum work? Does Cody's method work? Explain.



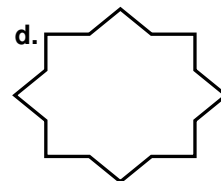
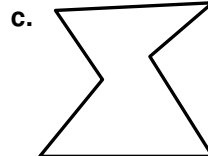
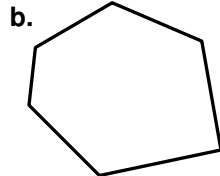
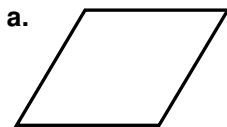
Interior Angle Sums: Homework

5. Find the missing angle measures if $m\angle a = 55^\circ$ and $m\angle e = 42^\circ$.
 Explain how you know for each angle using geometry vocabulary.



Statements	Reasons

6. Give the interior angle sum for each polygon. Show how you found your answer.



7. Find the interior angle sum of a 40-sided polygon. Show how you found your answer.