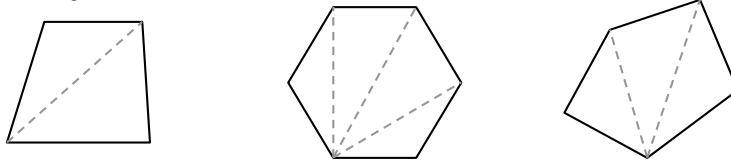


Interior Angle Sums: Classwork

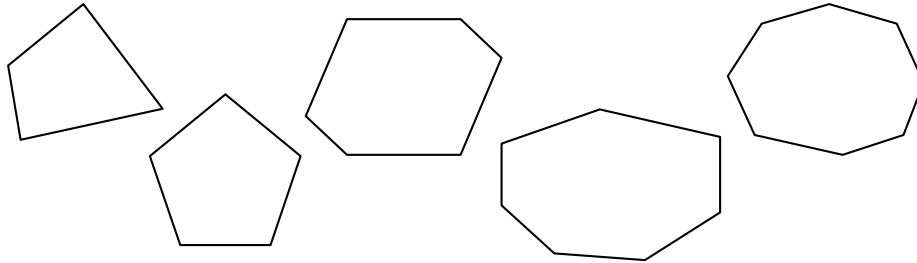
Zack and Cody claim that they can calculate the interior angle sum of any polygon. They each have a different strategy, and used diagrams to illustrate their reasoning.

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. 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)		

- d. If we had a polygon that had 30 sides, how many triangles do you think would be inside it? What do you think would be the interior angle sum? (*Hint: use the pattern in the table!*)

- e. **Time to generalize!**

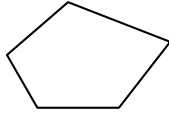
If the number of sides on a polygon is n , write a formula for the number of triangles inside the polygon. (*Hint: find the pattern in the table from part c!*)

Now write a formula for the interior angle sum of the polygon described above. (*Hint: find the pattern in the table from part c!*)

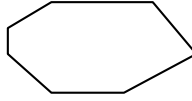
Interior Angle Sums: Classwork

1. Use your formula to find the interior angle sum of each polygon described below. Show your work.

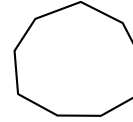
a.



b.



c.

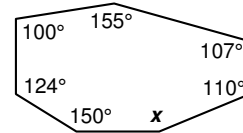
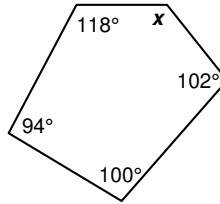
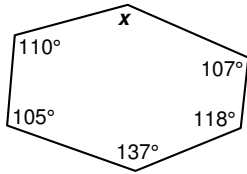


d. 25-sided polygon

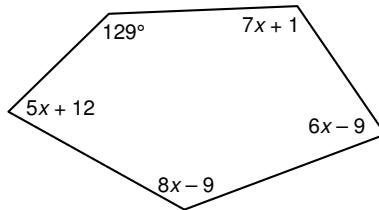
e. 38-sided polygon

f. 75-sided polygon

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



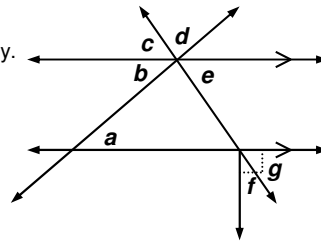
3. Use what you know about interior angle sums to find the measure of each angle. Show your algebra work.



4. A triangle's largest interior angle is three times the measure of its smallest interior angle. The third angle is 5° more than the measure of the smallest angle. What are the three angles?

Let x = the measure of the smallest angle. Write and solve an equation based on the interior angle sum.

5. Find the missing angle measures if $m\angle a = 42^\circ$ and $m\angle d = 65^\circ$.
Explain how you know for each angle using geometry vocabulary.



Statements	Reasons
1. $m\angle b =$	
2. $m\angle c =$	
3. $m\angle e =$	
4. $m\angle g =$	
5. $m\angle f =$	