

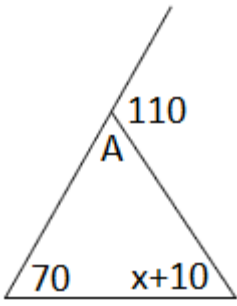
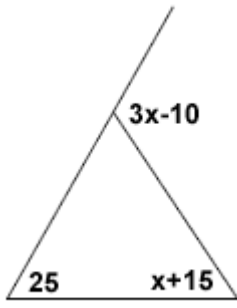
FIRST LEGO LEAGUE - Ontario

Record				
Number of Sides	Shape	Size of Turn Angle	Interior Angle	Sum of all Interior Angles
3	Equilateral Triangle	~120	60	180
4	Square	~90	90	360
5	Regular Pentagon	~72	108	540
6	Regular Hexagon	~60	120	720

Questions	
Question 1 Math	Do you see a pattern between the number of sides, and the size of the angles in that shape?
As you increase the number of sides, the angle needed to turn decreases.	
Question 2 Math	Estimate what angle a 12 sided shape (a dodecagon) might have. Use the data you have collected to guide your intelligent guess.
Estimate should be between 120 and 180. Actual angle is 150.	
Question 3 Math	The general formula for the SUM of all the interior angles of any polygon is 180 multiplied by some factor which takes into the account the number of sides. Experiment until you find a multiplier that fits the pattern from your observations.
180 x (n-2) Where n is the number of sides.	
Question 4 Coding	Since all sides of a regular polygon are the same. Write a general formula for the interior angles of any polygon.
180(n-2)/n	
Question 5 Coding	Use your general formula, to calculate the interior angles of a 24 sided regular pentagon.
180(24-2)/24 = 165	
Question 6	Why are general formulas so useful?

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Coding	
Because they allow us to make predictions without having to measure.	

<p>Extension Math</p>	<p>1. The triangle below is simpler than it looks, since there are many rules to what those angles need to be.</p>  <p>Use logic and reasoning to find out the interior angles of this triangle, as well as x. You can use your robot to see if your estimates do in fact trace out a closed triangle.</p> <p>2. For a real challenge, try this triangle (not drawn to scale)</p> 
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$$180 = 110 + A$$

$$A = 180 - 110$$

$$A = \underline{70}$$

$$70 + 70 + (x+10) = 180$$

$$x+10 = \underline{40}$$

$$x = 30$$

2.

$$25+(x+15)+[180-(3x-10)]=180$$

$$x-3x + 230 = 180$$

$$-2x = -50$$

$$X = 25$$