Name	Date	Class

LESSON Practice B

6-1 *Properties and Attributes of Polygons*

Tell whether each figure is a polygon. If it is a polygon, name it by the number of its sides.



4. For a polygon to be regular, it must be both equiangular and equilateral. Name the only type of polygon that must be regular if it is equiangular.

Tell whether each polygon is regular or irregular. Then tell whether it is concave or convex.



Properties and Attributes of Polygons	6-1 Properties and Attributes of Polygons		
Match each vocabulary term on the left with a part of polygon ABCDE on the right.	Tell whether each figure is a polygon. If it is a polygon, name it by the number of its sides.		
1. a diagonal B A. point D			
2. a side of the polygon \underline{C} B. \overline{CE}			
3. a vertex of the polygon A C. CD			
A polygon is a closed flat figure made of straight segments that do not cross each other. Tell whether each figure is a polygon. If it is a polygon, name it by the number of its sides.	polygon; nonagon not a polygon not a polygon		
4. 5. 6.	 For a polygon to be regular, it must be both equilangular and equilateral. Name the only type of polygon that must be regular if it is equiangular. triangle 		
	Tell whether each polygon is regular or irregular. Then tell whether it is concave or convex.		
not a polygon polygon; octagon not a polygon			
A regular polygon has all sides congruent and all angles congruent. Tell whether each polygon is regular or irregular. A concave polygon has a pair of sides that	irregular; concave regular; convex irregular; convex		
7 8 9	8. Find the sum of the interior angle measures of a 14-gon. 2160°		
	9. Find the measure of each interior angle of hexagon ABCDEF.		
	$\mathbf{m} \angle \mathbf{A} = 60^{\circ}; \ \mathbf{m} \angle \mathbf{B} = \mathbf{m} \angle \mathbf{D} = \mathbf{m} \angle \mathbf{F} = 150^{\circ}; \qquad \mathbf{A} \overset{5a^{\circ}}{\underset{5a^{\circ}}{\overset{4a^{\circ}}{\underset{5a^{\circ}}{\overset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\overset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\overset{5a^{\circ}}{\underset{5a^{\circ}}}{\underset{5a^{\circ}}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{\underset{5a^{\circ}}{5a^{\circ$		
regular; convex irregular; concave irregular; convex	$\underline{m} \subset \mathcal{C} = 120^\circ; \underline{m} \subset \mathcal{E} = 90^\circ \qquad \qquad$		
Honeybees store their honey in honeycombs. The honeycomb is made of many small wax compartments that are perfect regular hexagons.	10. Find the value of <i>n</i> in pentagon <i>PQRST</i> .		
10. Use the Polygon Angle Sum Theorem to find the sum of the interior angle measures of a regular hexagon. 720°	The same set of the se		
11. Find the measure of one interior angle of a regular hexagon. (Hint: Divide the answer to Exercise 10 by the number of cides) 120°	Before electric or steam power, a common way to power machinery was with a waterwheel. The simplest form of waterwheel is a series of naddless on a frame partially		
12. Use the Polygon Exterior Angle Sum Theorem to find the sum of the exterior	submerged in a stress of paddes of a frame particularly pushes the paddles forward and turns the frame.		
angle measures, one exterior angle at each vertex, of a regular hexagon.	The power of the turning frame can then be used to drive machinery to saw wood or grind grain. The waterwheel shown has a frame in the shape of a regular octagon.		
(<i>Hint:</i> Divide the answer to Exercise 12 by the number of sides.)	11. Find the measure of one interior angle of the waterwheel.		
	12. Find the measure of one exterior angle of the waterwheel.		
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Practice C Find the sum of the interior angle measures of each <i>n</i> -gon. 1. 52-gon 2. 102-gon 3. 1002-gon 9000° 18,000° 180,000° 4. Do you believe there is an upper limit to the sum of the interior angle measures in <i>n</i> -gons? Explain your reasoning. POSSible answer: No; a convex polygon may have any number of sides. As the number of sides increases, so does the sum of the interior angle measures. So the sum has no upper limit. 5. A polygon is convex if no part of a diagonal lies in the exterior of the polygon. Write an alternative definition for convex based on interior angles. Possible answer: A polygon is convex if each interior angle and the interior of the polygon together contain all points of the polygon. Any regular polygon can be inscribed in a circle. For Exercises 6-9, find the length of a side of the regular polygon in terms of <i>r</i> , the radius of the circle. Give the lengths in simplest radical form. 6. regular quadrilateral (square) Image: Convex if the dotted lines show a square.) $r \sqrt{2} - \sqrt{2}$ Image: Convex if convex	Review for Mastery Image: Colspan="2">Image: Colspan="2" Image: Colspan="2"		
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