

ANSWER KEY SO YOU CAN CHECK YOUR WORK. Be sure you show how you calculated your answers!

1. Complete the table below for regular polygons by filling in the blank with one of the following: *increases, decreases, does not change*.

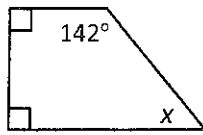
As the number of sides	The sum of the interior angles	The measure of one interior angle	The sum of the exterior angles	The measure of one exterior angle	The measure of one central angle
<b>Increases</b>	<i>Increases</i>	<i>Increases</i>	<i>Does not change</i>	<i>Decreases</i>	<i>Decreases</i>
<b>Decreases</b>	<i>Decreases</i>	<i>Decreases</i>	<i>Does not change</i>	<i>Increases</i>	<i>Increases</i>
<i>Increases</i>	<b>Increases</b>	<i>Increases</i>	<i>Does not change</i>	<i>Decreases</i>	<i>Decreases</i>
<i>Decreases</i>	<i>Decreases</i>	<i>Decreases</i>	<i>Does not change</i>	<b>Increases</b>	<i>Increases</i>
<i>Decreases</i>	<i>Decreases</i>	<b>Decreases</b>	<i>Does not change</i>	<i>Increases</i>	<i>Increases</i>

Show your work for all of the following problems

2. Calculate the sum of the measures of the interior angles of a 95-gon.  
[16,740°]
3. Use the theorems for interior and exterior angles of a polygon to find:
  - a) the measure of each exterior angle in a regular 12-gon (dodecagon).  
[30°]
  - b) the number of sides of an n-gon if the sum of the interior angles is 2520°.  
[16 sides]
  - c) the number of sides of a regular n-gon if one exterior angle measures 20°  
[18 sides]
  - d) the number of sides of a regular n-gon if one interior angle measures 170°.  
[36 sides]

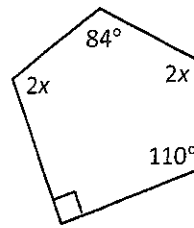
4. Find  $x$  and/or  $y$ .

a.

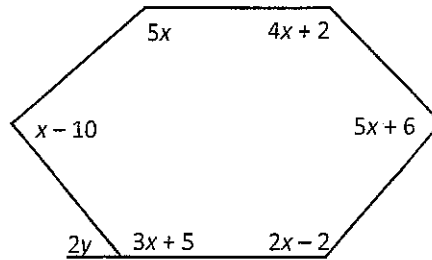


[a.  $x = 38^\circ$ ; b.  $x = 64^\circ$ ]

b.

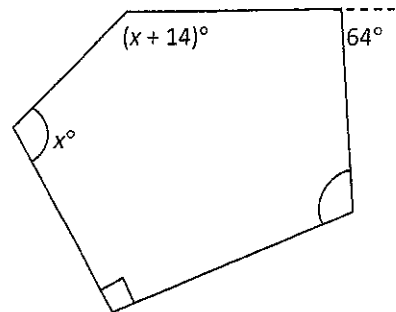


c.



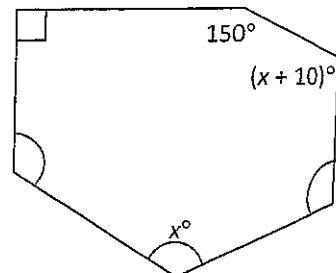
[ $x = 35.95^\circ$ ;  $y = 72.025^\circ$ ]

d.



d. [ $x \approx 106.7$ ]

e.



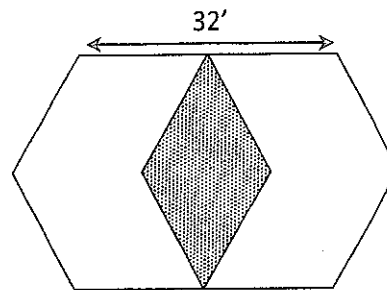
e. [ $x \approx 117.5$ ]

5. If each exterior angle on a regular polygon has a measure of  $12^\circ$ , how many sides will the polygon have?

[30 sides]

6. Find the area of the region where the congruent regular hexagons overlap.

$[128\sqrt{3} \approx 221.7 \text{ in}^2]$



7. Draw and label a regular hexagon, then find the area of the regular hexagon with an apothem length of 6 cm.

$[\approx 124.7 \text{ cm}^2]$

8. Draw and label a regular octagon, then find the area of the regular octagon with a radius of 9 cm.

$[\approx 229.1 \text{ cm}^2]$

9. The area of a triangle is  $17 \text{ in}^2$ . How tall is the triangle if the base is 4 inches?

$[8.5 \text{ in}]$

10. The area of the triangle is  $302.6 \text{ cm}^2$ . If the height is 7 cm, calculate the length of the base to the nearest tenth of a cm.

$[86.5 \text{ cm}]$

11. Find the length of AB when the area of the triangle ABC is  $95.7 \text{ mm}^2$ . Round answer to nearest 0.1 mm.

$[21.2 \text{ mm}]$

