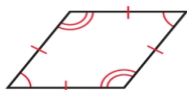
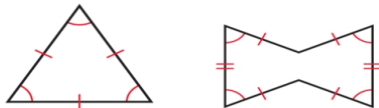
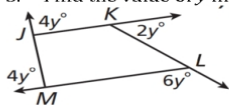


Worksheet of Polygons

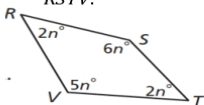
1. Tell whether each polygon is regular or irregular. Tell whether it is concave or convex.



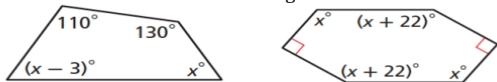
2. Find the sum of the interior angle measures of a convex 20-gon.
3. Find the value of  $y$  in polygon  $JKLM$ .



4. Find the measure of each exterior angle of a regular pentagon.
5. In the polygon,  $\angle P$ ,  $\angle R$ , and  $\angle T$  are right angles, and  $\angle Q \cong \angle S$ . What are  $m\angle Q$  and  $m\angle S$ ?
6. Find the measure of each interior angle of quadrilateral  $RSTV$ .



7. A pentagon has exterior angle measures of  $5a^\circ$ ,  $4a^\circ$ ,  $10a^\circ$ ,  $3a^\circ$ , and  $8a^\circ$ . Find the value of  $a$ .
8. Find the value of  $x$  in each figure.



9. Find the number of sides a regular polygon must have to meet each condition.
- a) Each interior angle measure equals each exterior angle measure.

- b) Each interior angle measure is four times the measure of each exterior angle.
- c) Each exterior angle measure is one eighth the measure of each interior angle.

10. Name the convex polygon whose interior angle measures have each given sum.

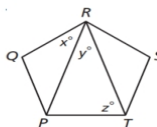
- a)  $540^\circ$     b)  $900^\circ$     c)  $1800^\circ$     d)  $2520^\circ$

11. An exterior angle measure of a regular polygon is given. Find the number of its sides and the measure of each interior angle.

- a)  $120^\circ$     b)  $72^\circ$     c)  $36^\circ$     d)  $24^\circ$

12. The interior angle measures of a convex pentagon are consecutive multiples of 4. Find the measure of each interior angle.

13. Polygon  $PQRST$  is a regular pentagon. Find the values of  $x$ ,  $y$ , and  $z$ .



14. Polygon  $ABCDEFGHJK$  is a regular decagon. Sides  $AB$  and  $DE$  are extended so that they meet at point  $L$  in the exterior of the polygon. Find  $m\angle BLD$ .

15. Does the Polygon Angle Sum Theorem work for concave polygons? Draw a sketch to support your answer.

16. Find the area of each regular polygon.



17. Find the area of a regular nonagon with a perimeter of 144 in.

18. Find the area of a regular pentagon with an apothem of 2 ft.

19. Show that the formula for the area of a regular  $n$ -gon approaches the formula for the area of a circle as  $n$  gets very large.