

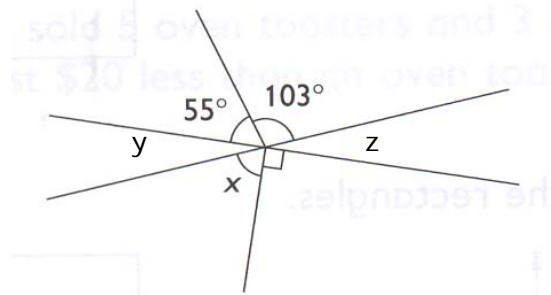
Assignment 5: Special Angles and Angle Theorems

The following figures are not drawn to scale. DO NOT use your protractor to measure the angles.

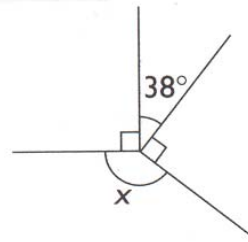
1. $m\angle x =$ _____

$m\angle y =$ _____

$m\angle z =$ _____



2. $m\angle x =$ _____



3. In $\triangle ABC$, line DE is parallel to line AB , and line DF is parallel to line AC . If $m\angle C = 70^\circ$ and the $m\angle B = 45^\circ$, find the measures of the angles labeled 1, 2, 3, 4, and 5.

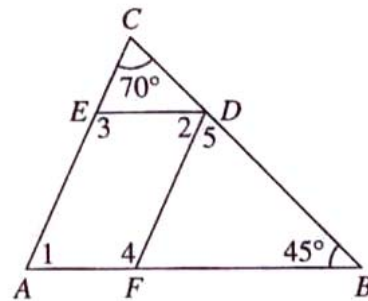
$m\angle 1 =$ _____

$m\angle 2 =$ _____

$m\angle 3 =$ _____

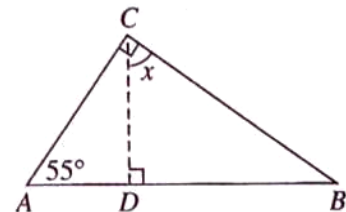
$m\angle 4 =$ _____

$m\angle 5 =$ _____



5. If $\angle ACB$ is a right angle as shown, and the other angles are as indicated in the figure, find $m\angle DCB$

$m\angle DCB =$ _____



6. Interior angles of a polygon

(a) the sum of the measures of the interior angles of a convex polygon is given by the formula: _____

(b) the sum of the measures of the interior angles of a hexagon is _____.

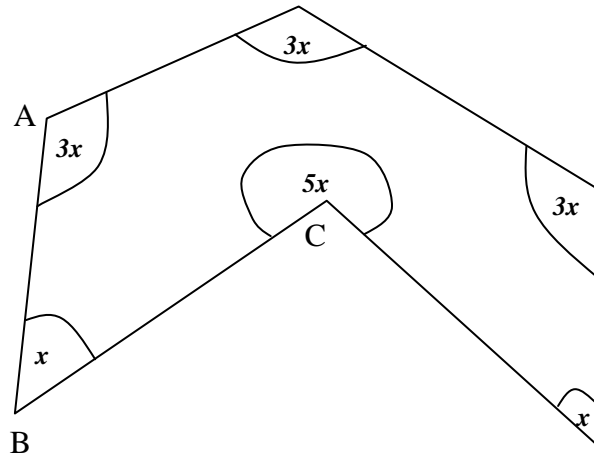
Using the above information, (Pretend it is convex)

Show how to find each of the following for the figure at the right.

(c) measure $\angle A =$ _____

(d) measure $\angle B =$ _____

(e) measure $\angle C =$ _____



7. For quadrilateral ABCD as shown, give the correct geometry symbol for each of the following:

_____ (a) The line containing the diagonal through C (not in the picture).

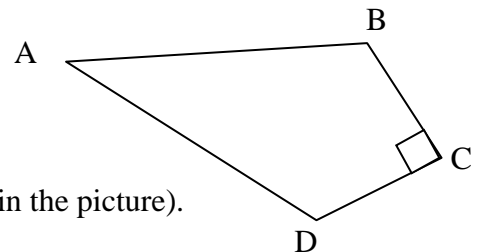
_____ (b) The diagonal containing B (not in the picture).

_____ (c) The length of the side AD to the nearest $\frac{1}{2}$ centimeter. (use your ruler for this)

_____ (d) The name of the angle **not** containing the point D on one of its sides

_____ (e) The measure of the interior angle at C

_____ (f) The ray that has vertex at D and is perpendicular to a side of the quadrilateral.



8. Answer these questions about special angle relationships.

_____ (a) What is the measure of the angle that is supplementary to an angle measure of 37° .

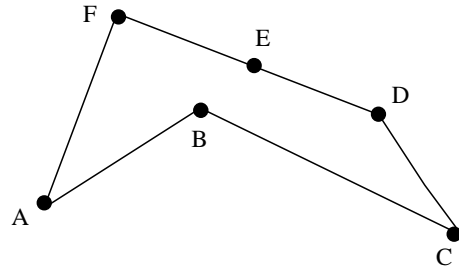
_____ (b) A triangle is equilateral. What is the measure of each interior angle?

_____ (c) What is the sum of the measures of the interior angles of a triangle?


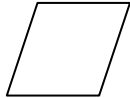
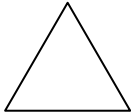
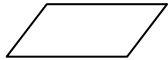

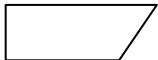
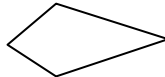

_____ (d) What is the sum of the measures of the exterior angles of a convex polygon?

9. List the letters of all the vertices of the polygon below with interior angles that appear to be

- (a) acute _____
- (b) right _____
- (c) obtuse _____
- (d) straight _____
- (e) greater than 180° _____



10. Identify each figure below by writing the letter or letters of the terms or definitions from the box **that are satisfied** by the figure. (You may have more than one Match per figure and you may use the terms from the box once, more than once, or not at all.)

- a. _____ 
- b. _____ 
- c. _____ 
- d. _____ 
- e. _____ 
- f. _____ 
- g. _____ 
- h. _____ 

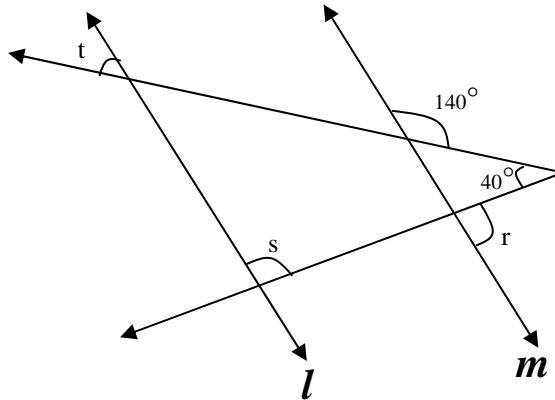
- A.** an equilateral triangle
- B.** a trapezoid
- C.** a quadrilateral with four sides the same length and four right angles
- D.** a quadrilateral with four right angles.
- E.** a kite
- F.** a quadrilateral with two pairs of parallel sides.
- G.** a quadrilateral with four sides the same length.
- H.** a quadrilateral with two pairs of adjacent sides the same length, but not all four sides the same length.
- I.** a regular polygon
- J.** a quadrilateral with exactly 1 pair of sides parallel.
- K.** a 4 sided polygon

11. Lines l and m are parallel. Find these angle measures:

(a) measure of $\angle t =$ _____

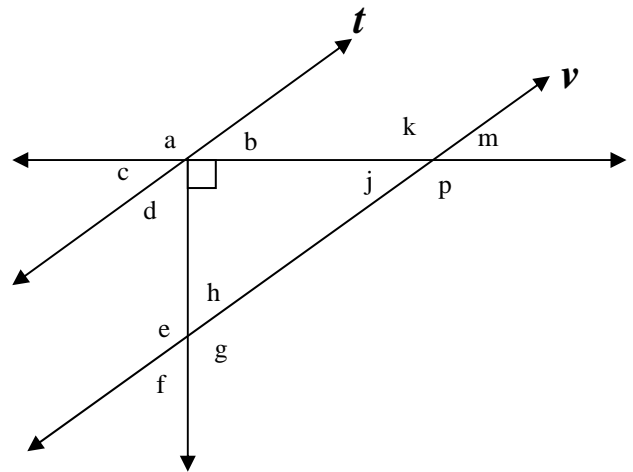
(b) measure of $\angle r =$ _____

(c) measure of $\angle s =$ _____

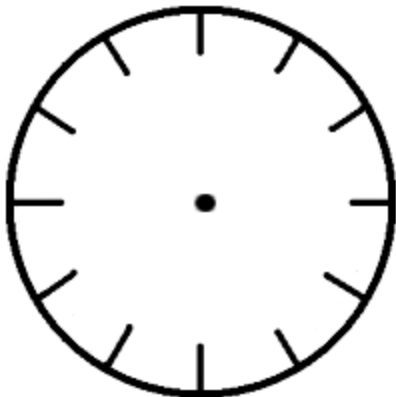


12. Line t is parallel to line v . Fill in the blanks below to make each statement true.

- $\angle c$ is complementary to \angle _____.
- $\angle j$ is vertical to \angle _____.
- $\angle p$ is alternate exterior to \angle _____.
- $\angle b$ is supplementary to \angle _____.
- $\angle d$ is alternate interior to \angle _____.
- $\angle a$ is corresponding to \angle _____.
- $\angle f$ is corresponding to \angle _____.



13. Find the angle formed by the minute and hour hands of a clock at 2:30.
Explain your thinking and why you did any computations you chose to use.
Hint: How many degrees in a full circle? How many between marks on the clockface?



14. For each part, name the regular polygon with the stated property.
Show any work and explain why you performed any computations that you use.

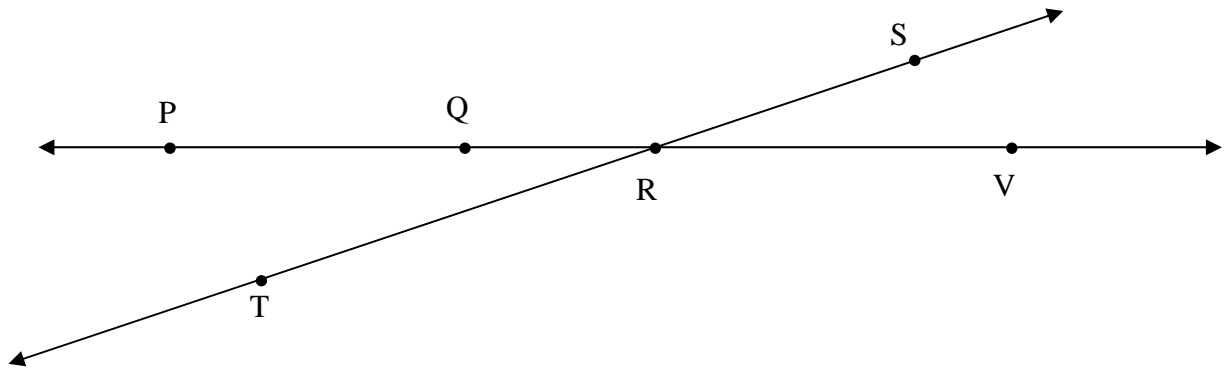
(a) The exterior angles each measure 45° . What is the polygon?

(b) The interior angles each measure 140° . What is the polygon?

15. Using the diagram below, write the result of each of these set operations.

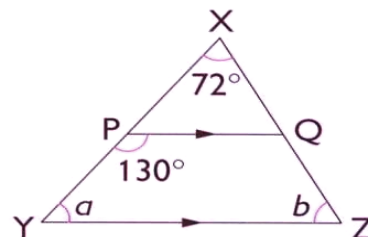
(a) $\overrightarrow{PQ} \cap \overline{VQ} = \underline{\hspace{2cm}}$ (b) $\overrightarrow{TS} \cap \overrightarrow{VQ} = \underline{\hspace{2cm}}$

(c) $\overline{TR} \cup \overrightarrow{RS} = \underline{\hspace{2cm}}$ (c) $\overrightarrow{RV} \cup \overrightarrow{RT} = \underline{\hspace{2cm}}$



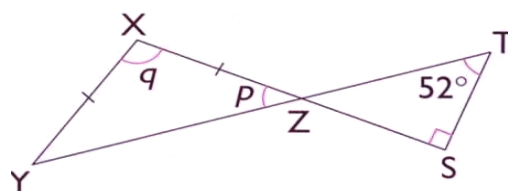
16. These diagrams are not drawn to scale. DO NOT use your protractor to measure the angles.
For the following problems, in addition to finding the answers, please briefly explain how you reasoned it. I have given you prompts on how to do this on problem #1. Also, remember the theorem that says base angles of isosceles triangles are congruent.

1. XPY and XQZ are straight lines.
 $PQ \parallel YZ$
Find $\angle a$ and $\angle b$.

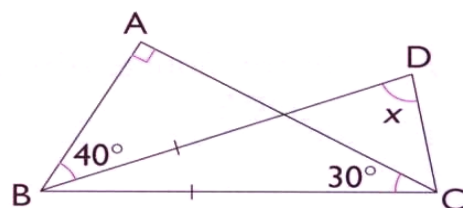


$m\angle QPR = 50^\circ$ because it is supplementary to angle _____.
 $m\angle a = 50^\circ$ because it is a corresponding angle to angle _____.
 $m\angle b = 58^\circ$ because the interior angles of triangle _____ must add up to 180°

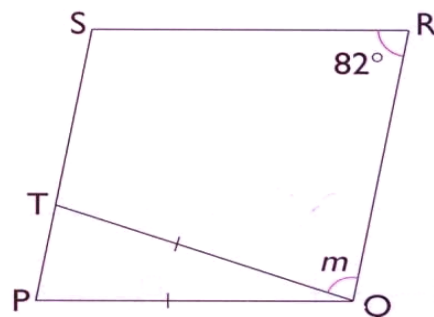
2. XZS and YZT are straight lines.
 $XY = XZ$
Find $\angle p$ and $\angle q$.



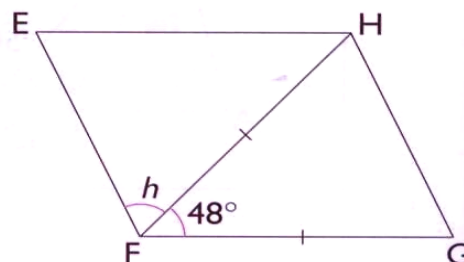
3. ABC is a right-angled triangle.
 BCD is an isosceles triangle.
 $BC = BD$
Find $\angle x$.



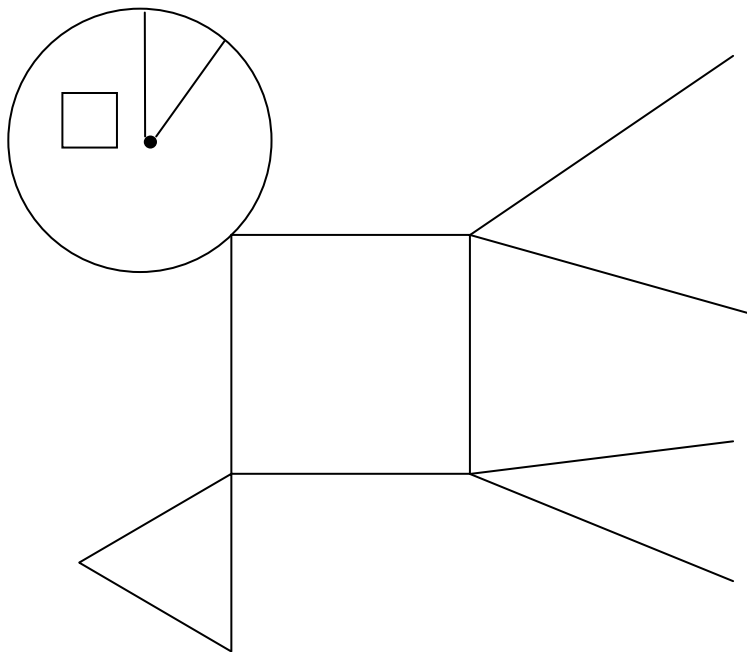
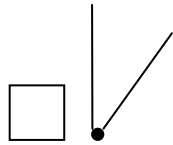
4. $PQRS$ is a parallelogram.
 $PQ = TQ$
Find $\angle m$.



5. $EFGH$ is a parallelogram.
 $FG = FH$
Find $\angle h$.



17. Use compass and straightedge ONLY to CONSTRUCT a copy of the geobeast. Begin your construction with the given “eye and mouth”. Leave your arcs! Use your notes if you need to. Do REAL constructions. You must show how you get perpendicular lines.



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