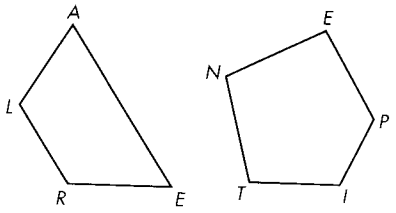
Investigation 2.5

Write a good definition of each geometric term or figure below. Once you are satisfied with the definitions you have written, discuss them with others near you. Try to arrive at one common definition your class can agree on for each term. Add these definitions to the definition list in your notebook. Draw and label a picture to illustrate each definition.

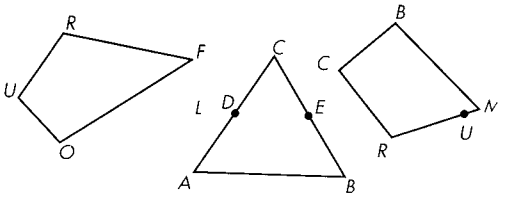
1. Define *diagonal of a polygon.*

Diagonals of polygons



Segments *AR*, *PN*, *TE*, and *PT* are diagonals.

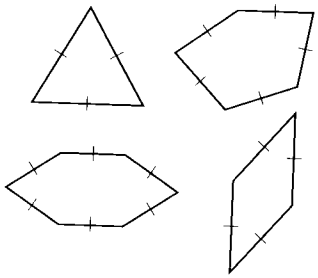
Not diagonals of polygons



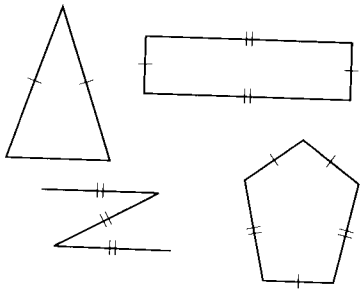
Segments *FL*, *FO*, *CU*, and *DE* are not diagonals.

2. Define *equilateral polygon.*

Equilateral polygons

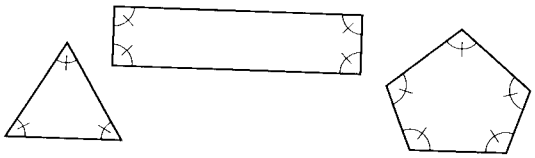


Not equilateral polygons

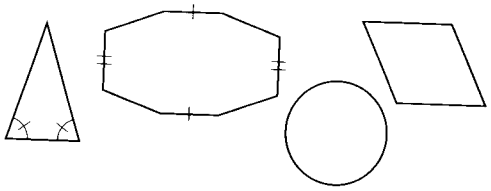


3. Define *equiangular polygon.*

Equiangular polygons

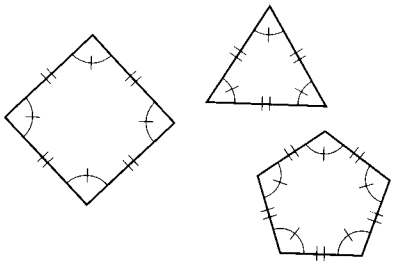


Not equiangular polygons

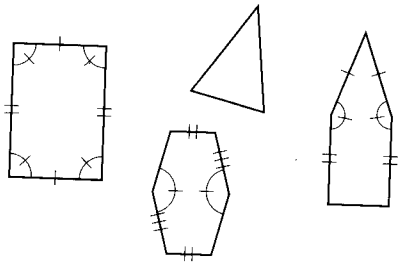


4.* Define *regular polygon.*

Regular polygons

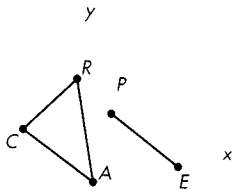


Not regular polygons

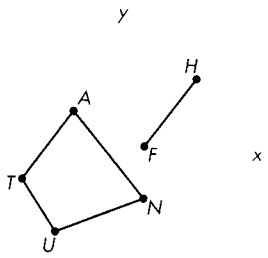


In Exercise 25, plot on graph paper the given triangle and the given segment. Locate a point T so that it appears that $\Delta CAR \cong \Delta PET$. Can you find more than one point? In Exercises 26 and 27, plot on graph paper the given quadrilateral and the given segment. Locate points I and S so that it appears that $TUNA \cong FISH$.

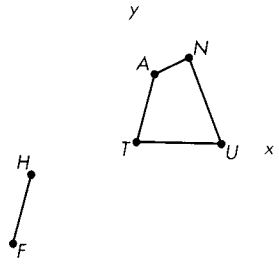
25.



26.

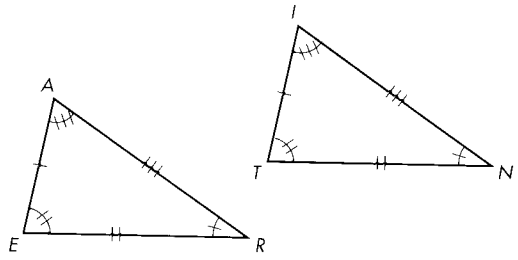


27.

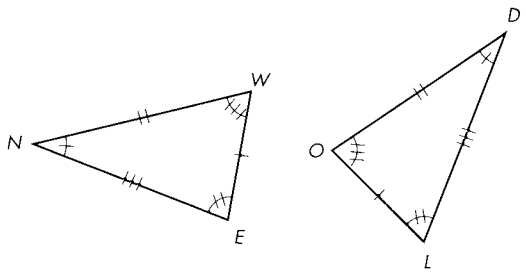


From the information given, determine the correct congruence statement.

28.* $\Delta EAR \cong \Delta$ -?-



29. $\Delta OLD \cong \Delta$ -?-



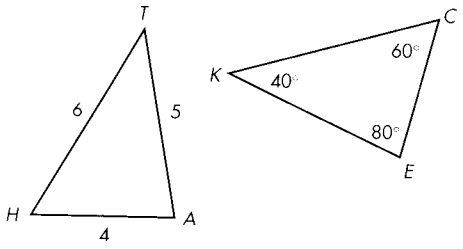
Find the missing measures in each pair of congruent polygons.

30. $\Delta HAT \cong \Delta CEK$

$m\angle H$ = -?- CE = -?-

$m\angle A$ = -?- EK = -?-

$m\angle T$ = -?- CK = -?-

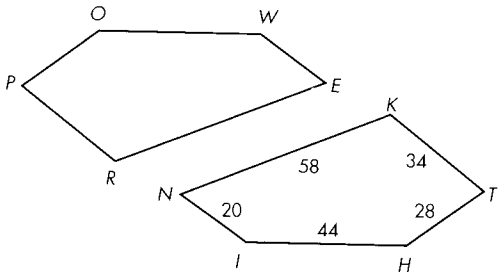


31.* $THINK \cong POWER$

PR = -?- RE = -?-

EW = -?- WO = -?-

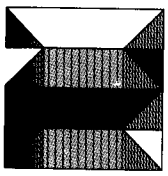
PO = -?-



32. Draw a counterexample to show that the converse of the following statement is false: "If a figure is a hexagon, then it is a polygon."

33. How many sides does a polygon have if it has 495 diagonals?

34. How many diagonals does a polygon have if it has 500 sides?



Lesson 2.6

Defining Triangles

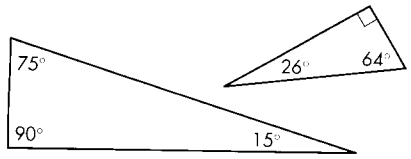
In this lesson you will write definitions that classify different kinds of triangles, based on relationships among their sides and angles.

Investigation 2.6

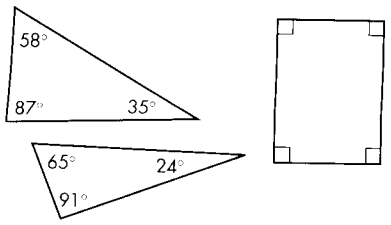
Write a good definition of each geometric figure or term. Discuss them with others in your class. Agree on a common set of definitions for your class and add them to your definition list. Draw and label a picture to illustrate each definition.

1.* Define *right triangle.*

Right triangles

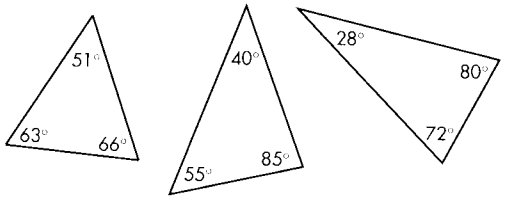


Not right triangles

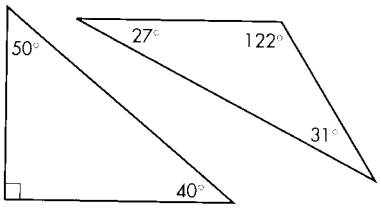


2. Define *acute triangle.*

Acute triangles

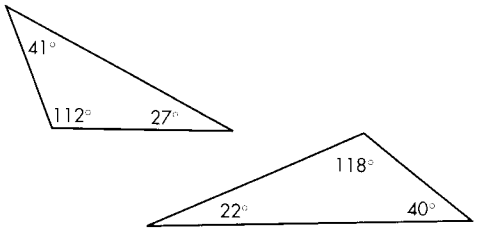


Not acute triangles

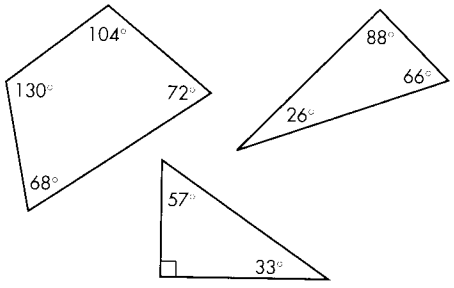


3. Define *obtuse triangle.*

Obtuse triangles

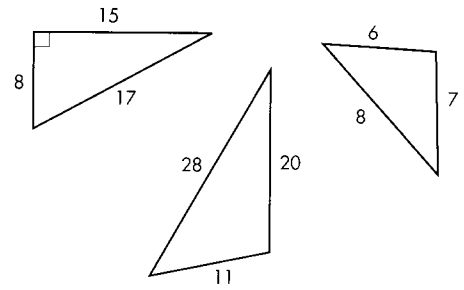


Not obtuse triangles

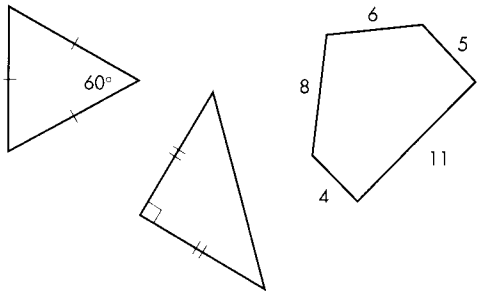


4. Define *scalene triangle.*

Scalene triangles

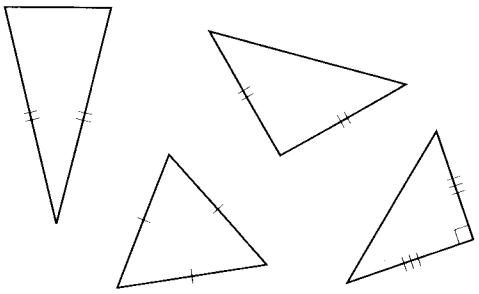


Not scalene triangles

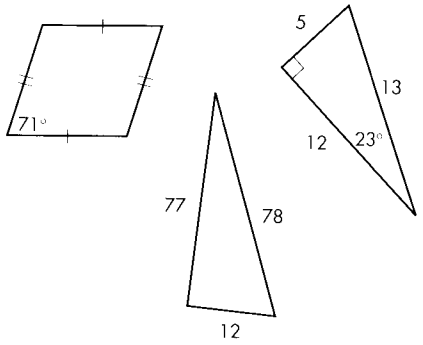


5. Define *isosceles triangle.*

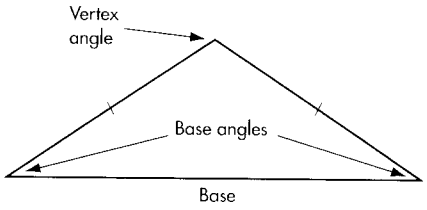
Isosceles triangles



Not isosceles triangles

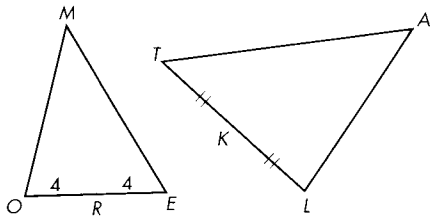


In an isosceles triangle, the angle between the two sides of equal length is called the **vertex angle**. The side opposite the vertex angle is called the **base** of the isosceles triangle. The two angles opposite the two sides of equal length are called the **base angles** of the isosceles triangle.



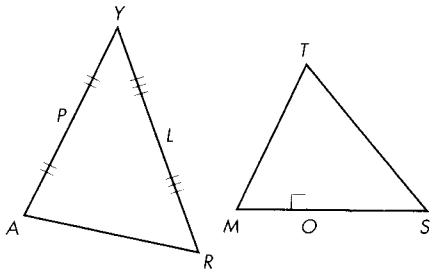
6. Define *median of a triangle.*

Medians of triangles



Segments *MR* and *AK* are medians.

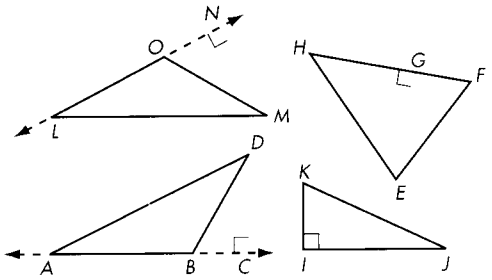
Not medians of triangles



Segments *PL* and *TO* are not medians.

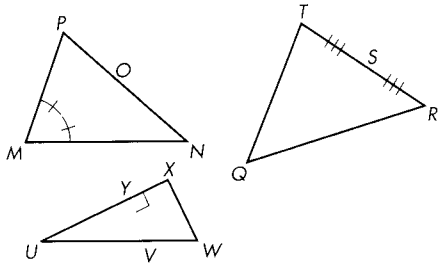
7. Define *altitude of a triangle.*

Altitudes of triangles



Segments *MN*, *EG*, *CD*, and *IK* are altitudes.

Not altitudes of triangles



Segments *MO*, *QS*, and *VY* are not altitudes.

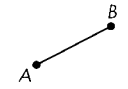
In a triangle, the length of the altitude is called the **height**. A triangle has three different altitudes, and, therefore, it has three different heights.

Exercise Set 2.6

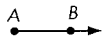
In Exercises 1–15, match the symbol or the term on the left with one of the figures on the right.

1. $\overline{AB}$
2. $\overrightarrow{AB}$
3. Isosceles ΔABC
4. Median of a triangle
5. Altitude of a triangle
6. Angle bisector in a triangle
7. Right ΔABC
8. Equilateral ΔABC
9. $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$
10. $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$
11. Vertical angles
12. Complementary angles
13. Supplementary angles
14. Hexagon
15. Octagon

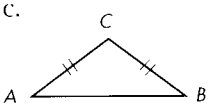
a.



b.



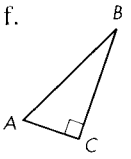
c.



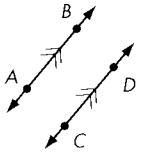
d.

e.

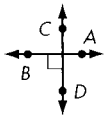
f.



g.



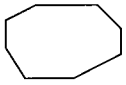
h.



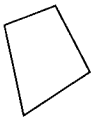
i.

$m\overline{AB}$

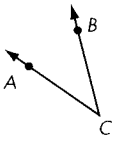
j.



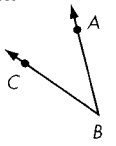
k.



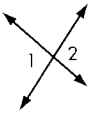
l.



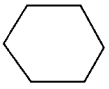
m.



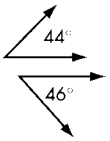
n.



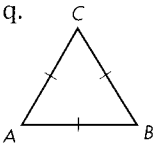
o.



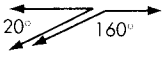
p.



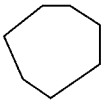
q.



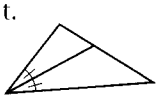
r.



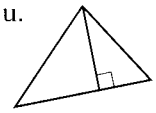
s.



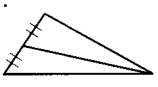
t.



u.



v.



w.