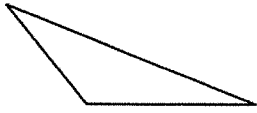


GEOMETRY POSTULATES AND THEOREMS

Triangles



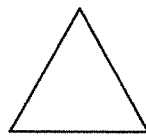
Scalene Triangle

(no sides the same)



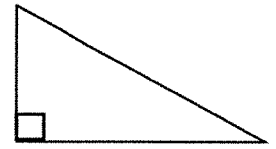
Isosceles Triangle

(2 sides \cong
and 2 \angle 's \cong)



Equilateral Triangle

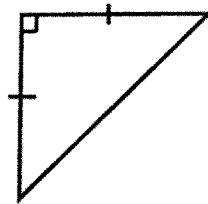
(3 sides \cong
and 3 \angle 's \cong)



Right Triangle

Isosceles Right Triangle

One angle is 90 and 2 sides are congruent



right-angled isosceles

Triangles Classified by Angles

Type	Angle(s)	Type	Angle(s)
Acute	All angles acute	Right	One right angle
Obtuse	One obtuse angle	Equiangular	All angles congruent

Angle Properties of an Isosceles Triangle:

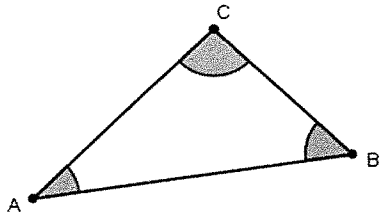
Angle Properties of an Equilateral Triangle:

Angle Properties of a Right Triangle:

GEOMETRY POSTULATES AND THEOREMS

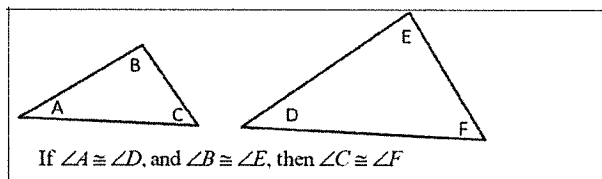
Triangle Sum Theorem

The sum of the measures of the angles in every triangle is 180° .



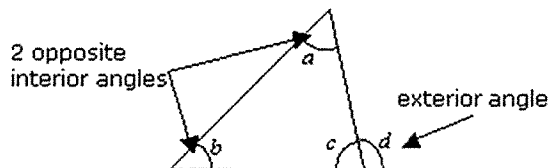
$$m\angle A + m\angle B + m\angle C = 180$$

Third Angle Theorem If two angles of one triangle are equal in measure to two angles of another triangle, then the third angle in each triangle is equal in measure to the third angle in the other triangle.



Triangle Exterior Angle Theorem

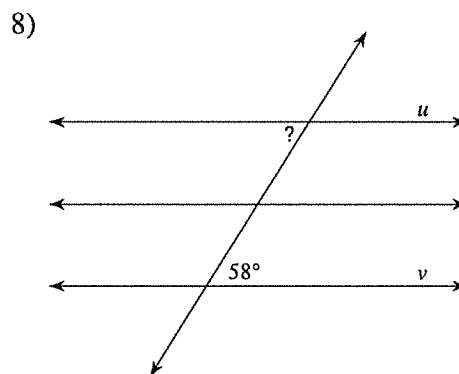
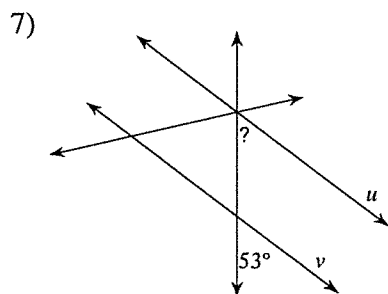
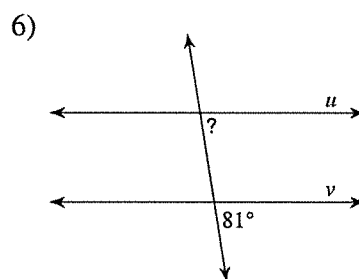
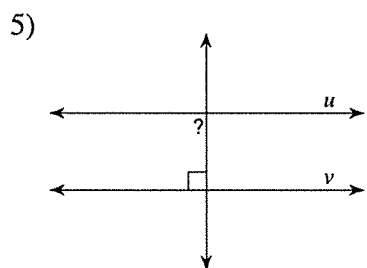
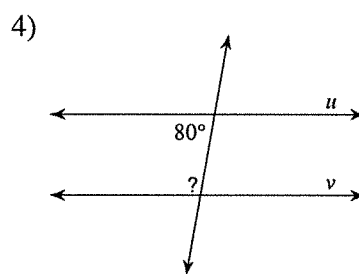
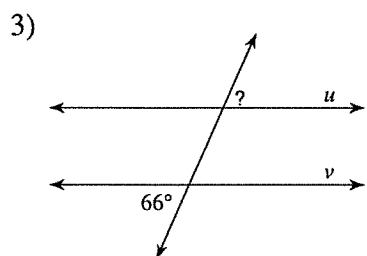
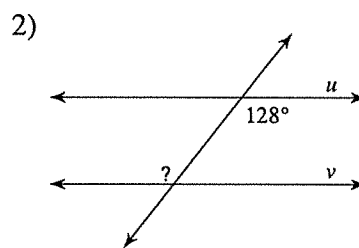
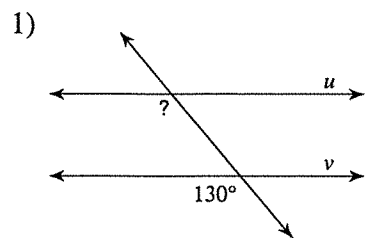
The measure of an exterior angle of a triangle is equal to the sum of the measures of the remote interior angles.



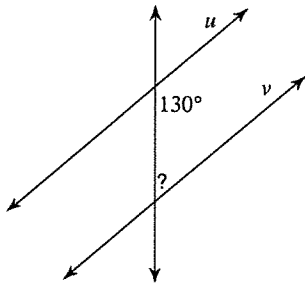
$$d = a + b$$

Proving Lines Parallel

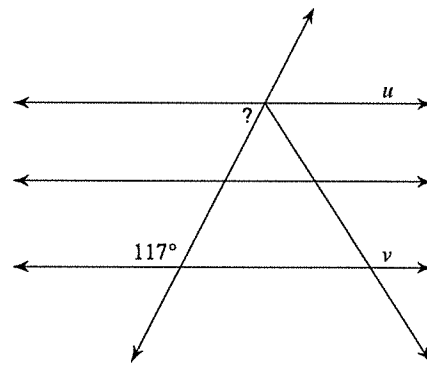
Find the measure of the indicated angle that makes lines u and v parallel.



9)

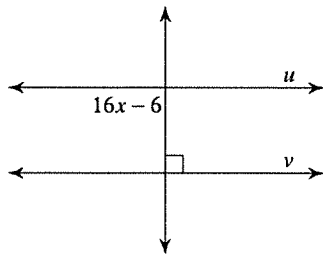


10)

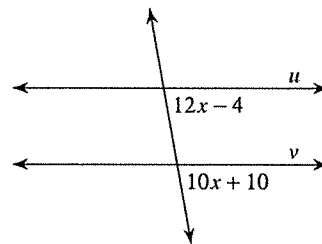


Find the value of x that makes lines u and v parallel.

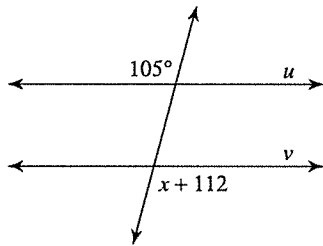
11)



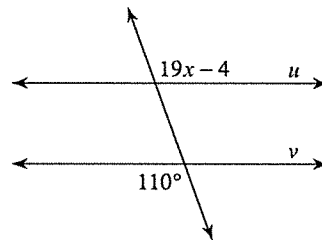
12)



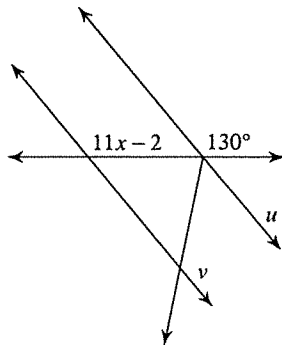
13)



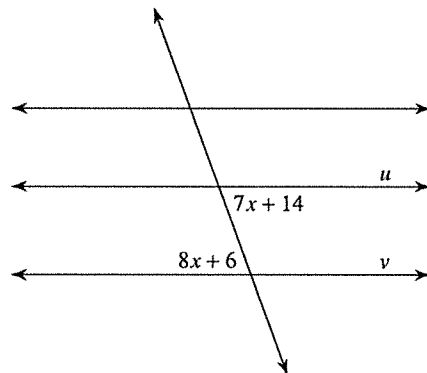
14)



15)



16)



Critical thinking questions:

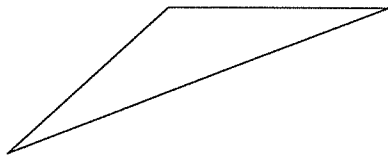
17) For question #16, find a value of x that makes lines u and v intersect.

18) Even if the lines in question #16 were not parallel, could $x = 25$? Why or why not?

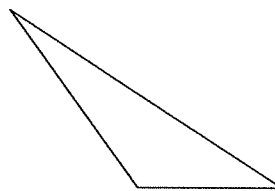
Classifying Triangles

Classify each triangle by each angles and sides. Base your decision on the actual lengths of the sides and the measures of the angles.

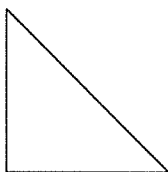
1)



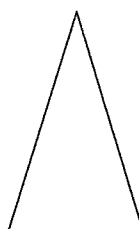
2)



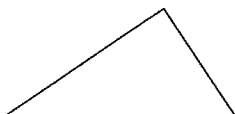
3)



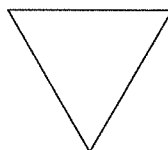
4)



5)

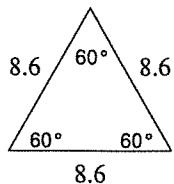


6)

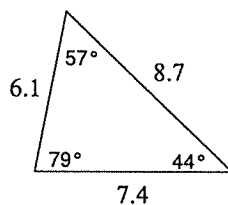


Classify each triangle by each angles and sides.

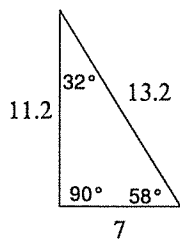
7)



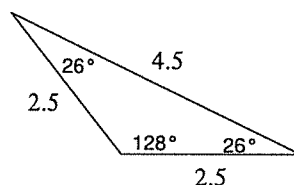
8)



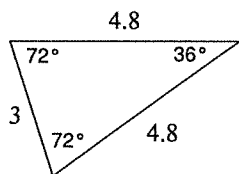
9)



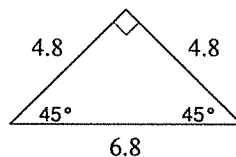
10)



11)



12)

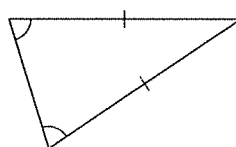


Classify each triangle by each angles and sides. Equal sides and equal angles, if any, are indicated in each diagram.

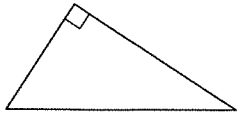
13)



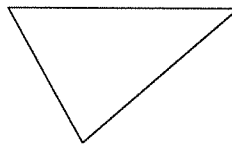
14)



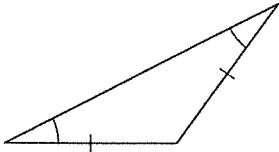
15)



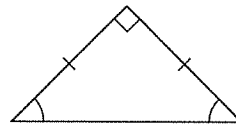
16)



17)



18)



Sketch an example of the type of triangle described. Mark the triangle to indicate what information is known. If no triangle can be drawn, write "not possible."

19) acute isosceles

20) right scalene

21) right isosceles

22) right equilateral

23) acute scalene

24) obtuse scalene

25) right obtuse

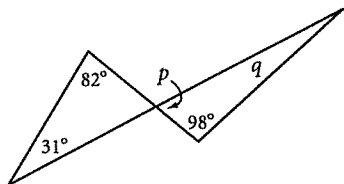
26) equilateral

Lesson 4.1 • Triangle Sum Conjecture

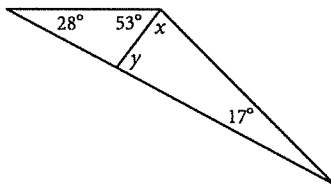
Name _____ Period _____ Date _____

In Exercises 1–9, determine the angle measures.

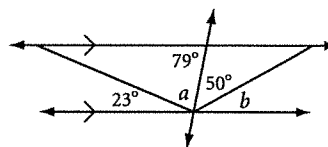
1. $p =$ _____, $q =$ _____



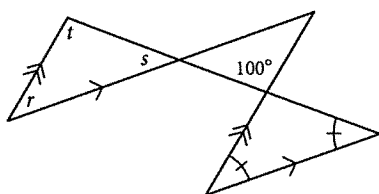
2. $x =$ _____, $y =$ _____



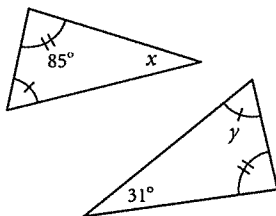
3. $a =$ _____, $b =$ _____



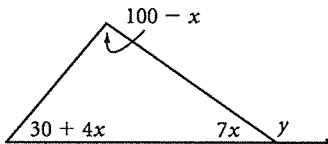
4. $r =$ _____, $s =$ _____,
 $t =$ _____



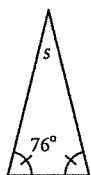
5. $x =$ _____, $y =$ _____



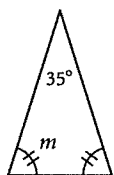
6. $y =$ _____



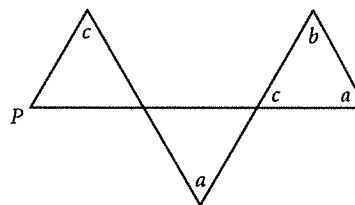
7. $s =$ _____



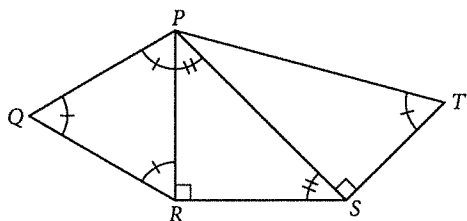
8. $m =$ _____



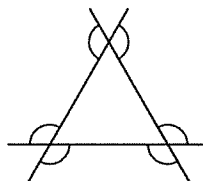
9. $m\angle P =$ _____



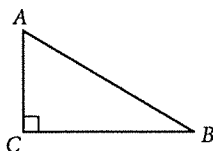
10. Find the measure of $\angle QPT$.



11. Find the sum of the measures of the marked angles.



12. Use the diagram to explain why $\angle A$ and $\angle B$ are complementary.



13. Use the diagram to explain why $m\angle A + m\angle B = m\angle C + m\angle D$.

