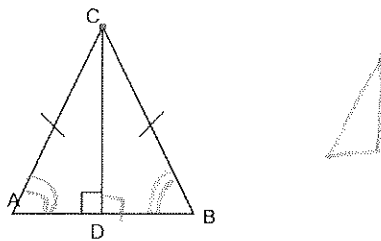


Geometry Chapter 4 Topics List

1. Triangle Interior Angle Sum Conjecture
2. Properties of Isosceles Triangles
 - a. Base Angle Congruence
3. Triangle Inequality Conjectures
 - a. Triangle Side Inequality Conjecture
 - b. Side-Angle Inequality Conjecture
 - c. Triangle Exterior Angle Conjecture
4. Triangle Congruency Conjectures
 - a. SSS (Side-Side-Side)
 - b. SAS (Side-Angle-Side)
 - c. ASA (Angle-Side-Angle)
 - d. SAA (Side-Angle-Angle)
 - e. Non-congruencies
 - i. SSA (Side-Side-Angle)
 - ii. AAA (Angle-Angle-Angle)

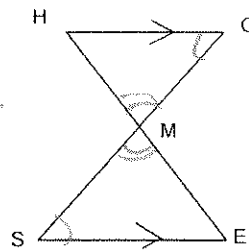
1. If the pair of triangles are congruent, write the congruent statement and the congruence property. If the pair of triangles are not congruent, state "cannot be determined"

a.



$\triangle ACD \cong \triangle BCD$
Conjecture: SAA

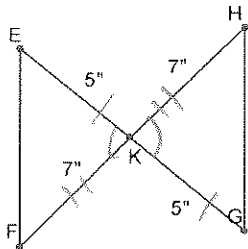
b.



$\triangle HMO \cong \triangle$ _____

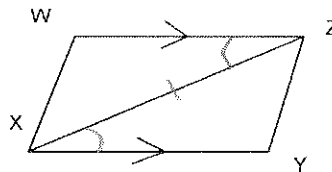
Conjecture: Can't be determined (no side)

c.



$\triangle EKF \cong \triangle GKH$
Conjecture: SAS

d.

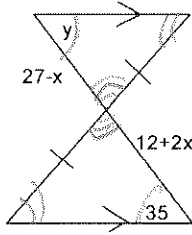


$\triangle WZX \cong \triangle$ _____

Conjecture: Can't be determined (not enough information)

2. Solve for x and/or y. Show all work.

a.



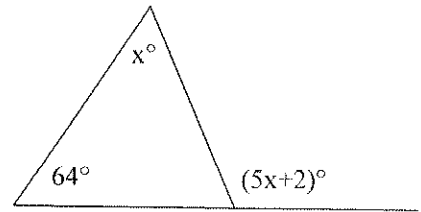
$$27-x = 12+2x$$

$$15 = 3x$$

$$x = 5$$

$$y = 35^\circ$$

b.



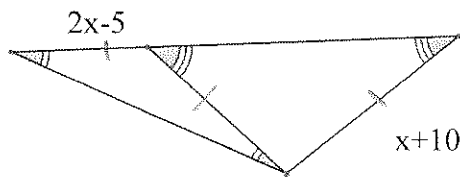
$$64 + x = 5x + 2$$

$$62 = 4x$$

$$\frac{62}{4} = x$$

$$x = \frac{31}{2} \text{ or } 15.5^\circ$$

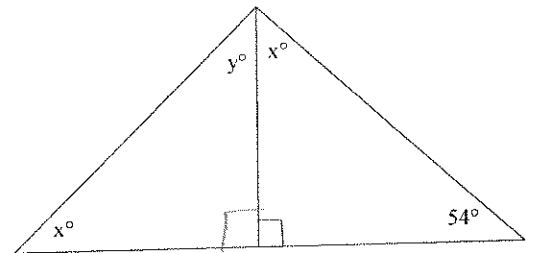
c.



$$2x-5 = x+10$$

$$x = 15$$

d.



$$x + 54 + 90 = 180$$

$$x = 36$$

$$y + 36 + 90 = 180$$

$$y = 54$$

3. Determine whether a triangle can be formed by the given side lengths. Explain your answer.

a) 4 m, 7 m, 8 m

$$4 + 7 > 8$$

$$\text{Yes}$$

b) 6 m, 10 m, 17 m

$$6 + 10 < 17$$

$$\text{No}$$

c) 5 ft, 6 ft, 13 ft

$$5 + 6 < 13$$

$$\text{NO}$$

d) 2 yd, 7 yd, 6 yd

$$2 + 6 > 7$$

$$\text{Yes}$$

e) 9 in., 20 in., 13 in.

$$9 + 13 > 20$$

$$\text{Yes}$$

f) 18 km, 21 km, 39 km

$$18 + 21 = 39$$

$$\text{NO}$$

g) 12 feet, 5 feet, 8 feet

$$5 + 8 > 12$$

$$\text{Yes}$$

h) 19 cm, 25 cm, 5 cm

$$19 + 5 < 25$$

$$\text{NO}$$

i) 4u, 2u, 7u

$$4u + 2u < 7u$$

$$\text{No}$$

4. The lengths of two sides of a triangle are given. Find all possible lengths of the third side.

a) 5 in, 7 in

$$5+7=12$$

$$7-5=2$$

$$2 \text{ in} < x < 12 \text{ in}$$

b) 9 cm, 16 cm

$$9+16=25$$

$$16-9=7$$

$$7 \text{ cm} < x < 25 \text{ cm}$$

c) 5 m, 6 m

$$6+5=11$$

$$6-5=1$$

$$1 \text{ m} < x < 11 \text{ m}$$

d) 11 km, 20 km

$$11+20=31$$

$$20-11=9$$

$$9 \text{ km} < x < 31 \text{ km}$$

e) 5 mm, 9 mm

$$5+9=14$$

$$9-5=4$$

$$4 \text{ mm} < x < 14 \text{ mm}$$

f) 23 ft, 38 ft

$$23+38=61$$

$$38-23=15$$

$$15 \text{ ft} < x < 61 \text{ ft}$$

g) 5 ft, 12 ft

$$5+12=17$$

$$12-5=7$$

$$7 \text{ ft} < x < 17 \text{ ft}$$

h) 30 m, 21 m

$$30+21=51$$

$$30-21=9$$

$$9 \text{ m} < x < 51 \text{ m}$$

i) 6u, 9u

$$6+9=15$$

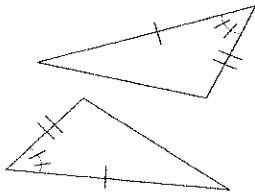
$$9-6=3$$

$$3 \text{ u} < x < 15 \text{ u}$$

5. If the pair of triangles are congruent, write the congruence property. If the pair of triangles are not congruent, state "cannot be determined".

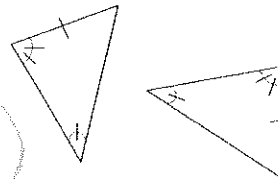
a.

SAS



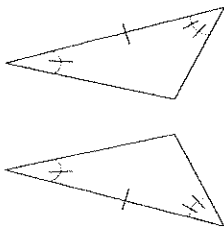
b.

SAA
(*AAS)



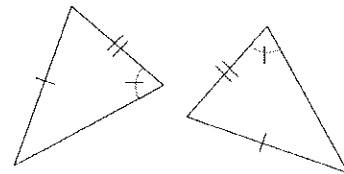
c.

ASA



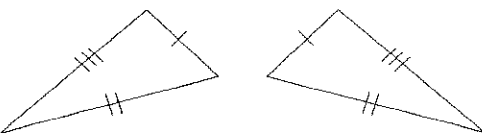
d.

cannot be determined



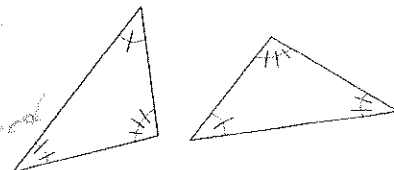
e.

SSS



f.

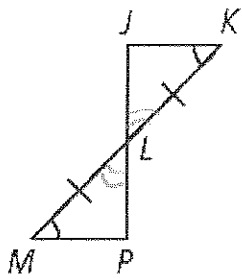
cannot be determined



6. Write a congruence statement for the triangles if they are congruent and state the congruence property. If the triangles are not congruent write "cannot be determined".

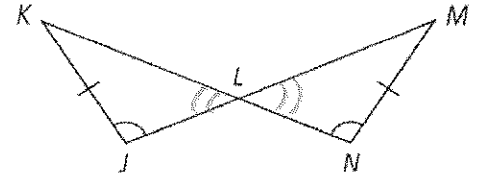
a. $\triangle KLP \cong \triangle MLP$

ASA



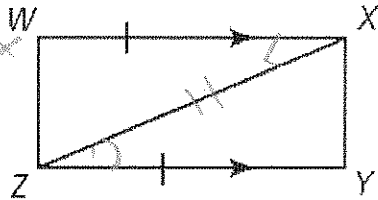
b. $\triangle KJL \cong \triangle MNL$

SAA
or AAS



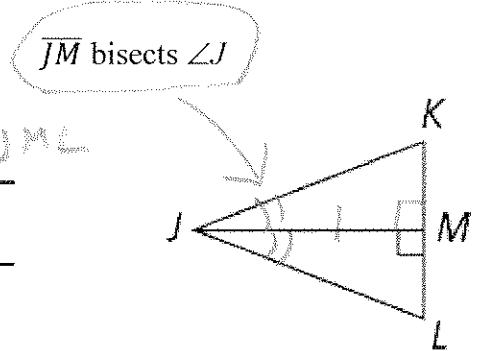
c. $\triangle WXZ \cong \triangle YZX$

SAS

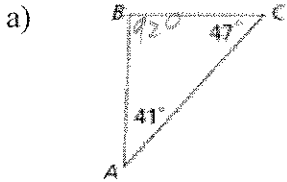


d. $\triangle JMI \cong \triangle JML$

ASA

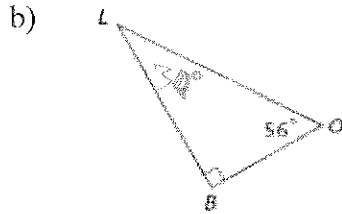


7. List the sides and angles of each triangle from largest to smallest.



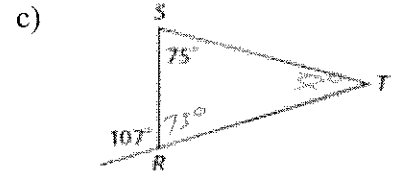
Sides: $\overline{AC} > \overline{BA} > \overline{BC}$

Angles: $\angle B > \angle C > \angle A$



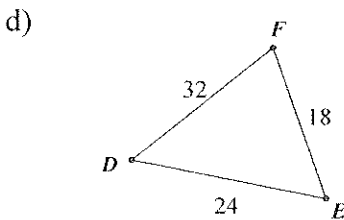
Sides: $\overline{OL} > \overline{LB} > \overline{BO}$

Angles: $\angle B > \angle O > \angle L$



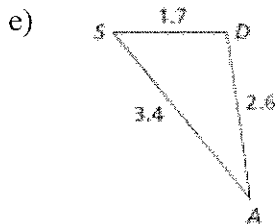
Sides: $\overline{RT} > \overline{ST} > \overline{SR}$

Angles: $\angle S > \angle R > \angle T$



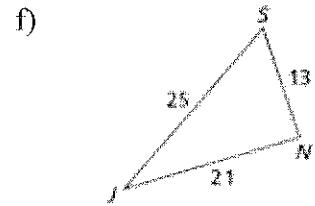
Sides: $\overline{DF} > \overline{DE} > \overline{FE}$

Angles: $\angle E > \angle F > \angle D$



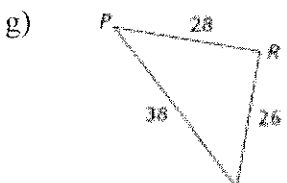
Sides: $\overline{SA} > \overline{DA} > \overline{SD}$

Angles: $\angle D > \angle S > \angle A$



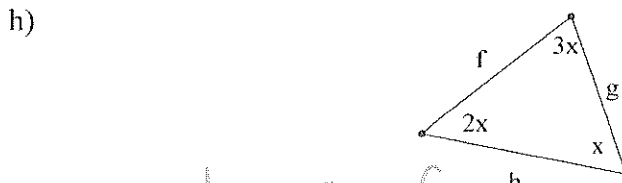
Sides: $\overline{JS} > \overline{JN} > \overline{SN}$

Angles: $\angle N > \angle S > \angle J$



Sides: $\overline{PO} > \overline{PR} > \overline{RO}$

Angles: $\angle R > \angle O > \angle P$



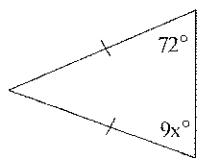
Sides: $\overline{h} > \overline{g} > \overline{f}$

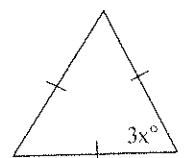
Angles: $\angle 3x > \angle 2x > \angle x$


9. What must ALSO be true if a triangle is equilateral? Equilateral

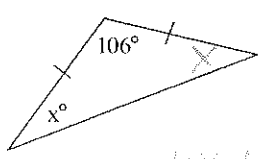
10. The vertex **angle bisector** of an isosceles triangle is also what other three line segments?
Median and perpendicular bisector and altitude

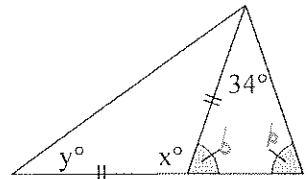
11. Solve for x and/or y . Show your work using equations.

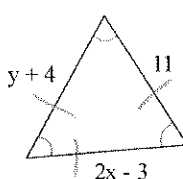
a. 
 $9x = 72^\circ$
 $x = 8^\circ$

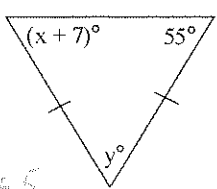
b. 
Equilateral
 $3x = 60^\circ$
 $x = 20^\circ$

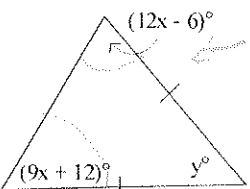
c. 
 $3x+4 = 22$
 $3x = 18$
 $x = 6$ units

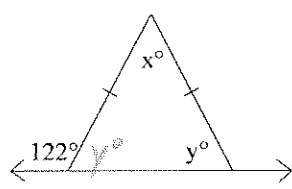
d. 
 $180 = 106 + x + x$
 $74 = 2x$
 $x = 37$
 $x = 37^\circ$

e. 
 $180 = 34 + 26$
 $146 = 26 = 73$
 $x + 73 = 180$
 $2y + 107 = 180$
 $2y = 73$
 $x = 107^\circ$ $y = \frac{73}{2}$ (36.5°)

f. 
 $2x-3 = 11$
 $2x = 14$
 $11 = y+4$
 $y = 7$
 $x = 7$ units $y = 7$ units

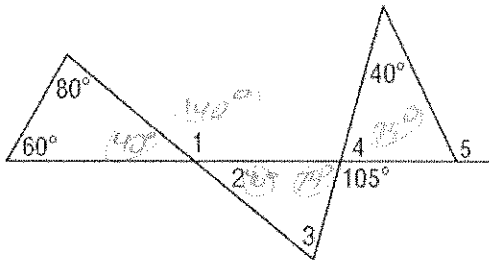
g. 
 $x+7 = 55$
 $x = 48$
 $y = 55 + 55 = 110$
 $x = 48^\circ$ $y = 70^\circ$

h. 
 $12x-6 = 9x+12$
 $3x = 18$
 $x = 6^\circ$ $y = 48^\circ$
 $y + 11 = 110$

i. 
 $180 - 122 + y$
 $y = 58$
 $x = 64^\circ$ $y = 55^\circ$
 $x + 28 + 58 = 180$
 $x = 64$

12-14. Solve for the missing parts.

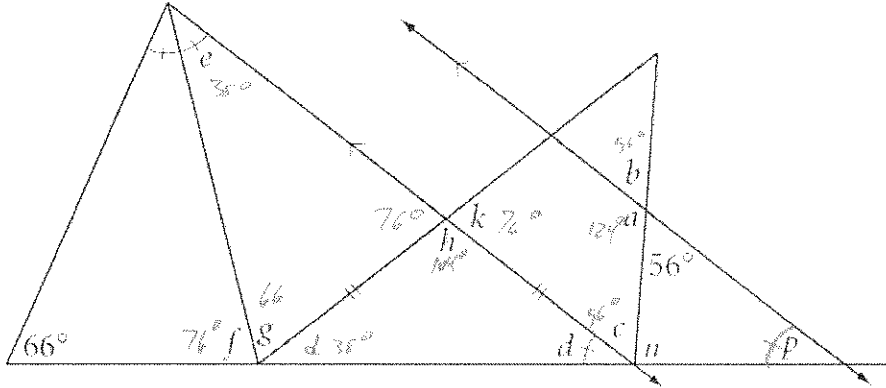
12.



$$m\angle 1 = \underline{140^\circ} \quad m\angle 2 = \underline{40^\circ} \quad m\angle 3 = \underline{65^\circ} \quad m\angle 4 = \underline{75^\circ}$$

$$m\angle 5 = \underline{115^\circ}$$

14.



$$a = \underline{124^\circ} \quad b = \underline{56^\circ}$$

$$e = \underline{38^\circ} \quad f = \underline{76^\circ}$$

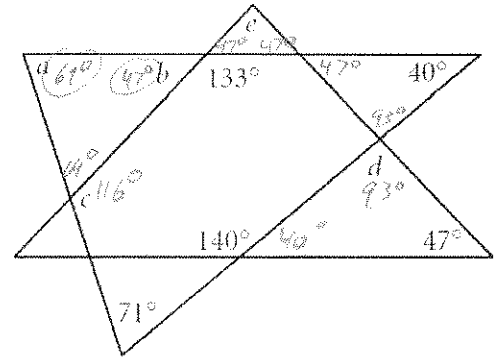
$$k = \underline{76^\circ} \quad n = \underline{86^\circ}$$

$$c = \underline{56^\circ} \quad d = \underline{38^\circ}$$

$$g = \underline{66^\circ} \quad h = \underline{104^\circ}$$

$$p = \underline{38^\circ}$$

13.



$$a = \underline{69^\circ} \quad b = \underline{47^\circ}$$

$$c = \underline{116^\circ} \quad d = \underline{93^\circ}$$

$$e = \underline{86^\circ}$$