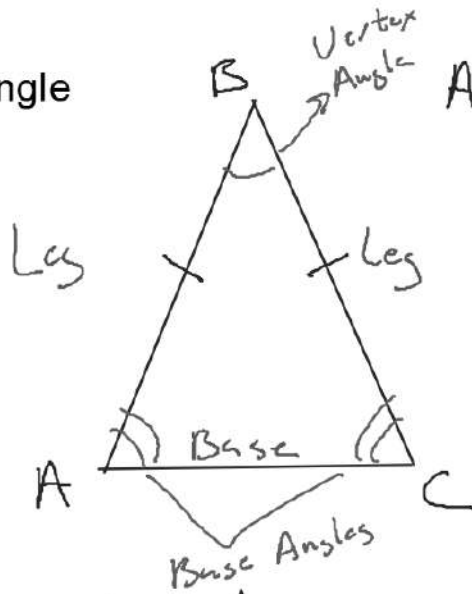


Isosceles Triangle



At least 2 congruent sides

The congruent sides are called legs.

Non-congruent side is called Base

Angle formed between the 2 legs

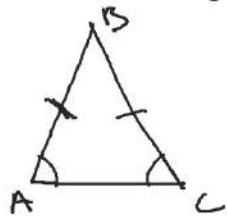
Vertex angle

Angles formed between legs and Base are called Base angles

Isosceles Triangle Theorem and the Converse

If two sides of a triangle are congruent, then the angles opposite those sides are congruent.

If... $\overline{AB} \cong \overline{BC}$,

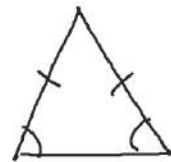


Then... $\angle ACB \cong \angle BAC$.

If a Δ is isosceles
then the base angles
are \cong .

If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

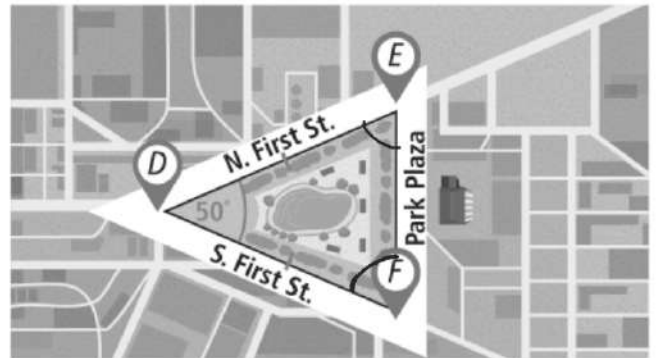
If... $\angle ACB \cong \angle BAC$,



Then... $\overline{AB} \cong \overline{BC}$.

If the base angles are \cong
then the Δ is isosceles.

🔊 An architect is designing a community park between N. First St. and S. First St. The pathways on either side of the pool will be equal in length and will provide effective access and circulation around the pool. To protect the landscaping and to minimize erosion, the architect will place a triangular section of triangular cobblestones at the corners along Park Plaza. What angle measure should the architect specify for the corners in her design?

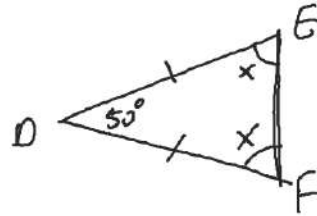


$$x + x + 50 = 180$$

$$2x + 50 = 180$$

$$\frac{2x}{2} = \frac{130}{2}$$

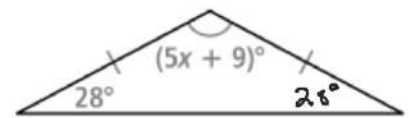
$$x = 65^\circ$$



Try It!

2. a. What is the value of x ?

Enter your answer.



$$28 + 28 + 5x + 9 = 180$$

$$5x + 65 = 180$$

$$-65 \quad -65$$

$$5x = 115$$

$$x = 23$$

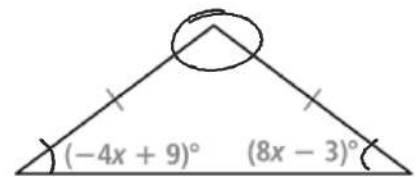
Try It!

2. b. What is the value of x ?

Enter your answer:

$$\begin{array}{r} -4x + 9 = 8x - 3 \\ +4x \quad +4x \end{array}$$

$$\begin{array}{r} 9 = 12x - 3 \\ +3 \quad +3 \\ \hline 12 = 12x \\ x = 1 \end{array}$$



What are the lengths of all three sides of the triangle?

SOLUTION

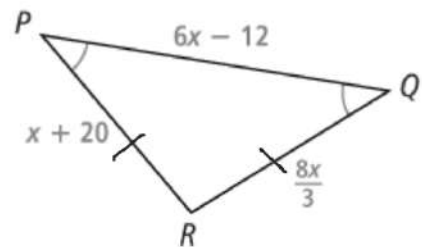
$$\overline{PR} \cong \overline{QR}$$

$$3(x+20) = \left(\frac{8x}{3}\right)3$$

$$\begin{array}{r} 3x + 60 = 8x \\ -3x \quad -3x \end{array}$$

$$\frac{60}{5} = \frac{5x}{5}$$

$$x = 12$$



$$PR = 12 + 20 = 32$$

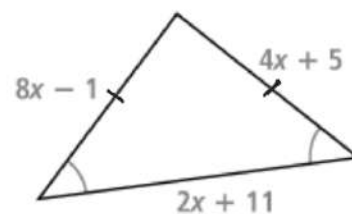
$$RQ = 32$$

$$\begin{aligned} PQ &= 6(12) - 12 \\ &= 60 \end{aligned}$$

Try It!

3. Use the figure shown.

a. What is the value of x ?



Enter your answer.

$$8x - 1 = 4x + 5$$

$$4x - 1 = 5$$

$$4x = 6$$

$$x = \frac{3}{2}$$

b. What are the lengths of all three sides of the triangle?

$$8\left(\frac{3}{2}\right) - 1 = 11$$

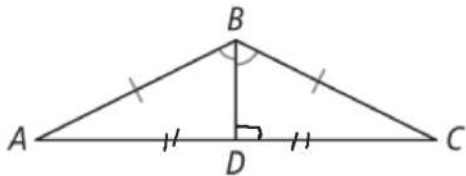
$$2\left(\frac{3}{2}\right) + 11 = 14$$

$$4\left(\frac{3}{2}\right) + 5 = 11$$

If a line or line segment bisects the vertex angle of an isosceles triangle, then it is also the perpendicular bisector of the opposite side.

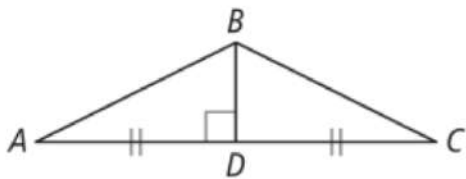
If...

$\overline{AB} \cong \overline{BC}$ and $m\angle ABD = m\angle CBD$

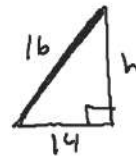
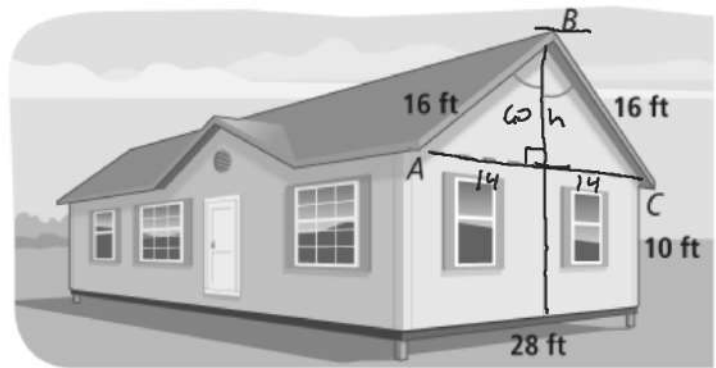


Then...

$\overline{BD} \perp \overline{AC}$ and $\overline{AD} \cong \overline{DC}$



A prefabricated house is delivered to a foundation in two symmetric halves that are assembled on-site. Along the planned route to the site, the truck must pass under a bridge that has a clearance height of 17 feet. Should the trucker plan a different route for delivering the house? Explain.



$$a^2 + b^2 = c^2$$

$$h^2 + 14^2 = 16^2$$

$$h = 7.75$$