April 19, 2017

11-4 Triangle Angles

Objectives:

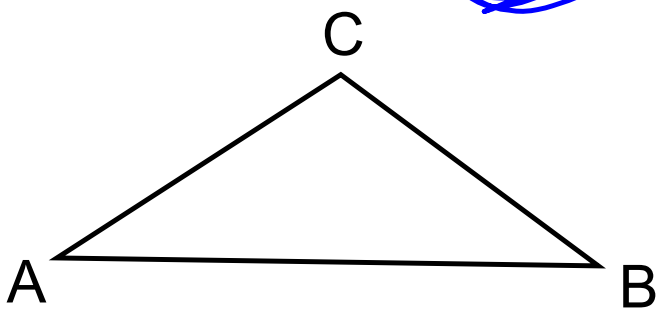
-I can find missing angles of triangles.

-I can use triangle properties to solve for a variable.

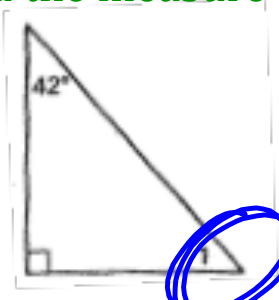
Triangle Sum Theorem

All 3 angles in a triangle will always have a sum of 180^0

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



Find the measure of the numbered angles.



?

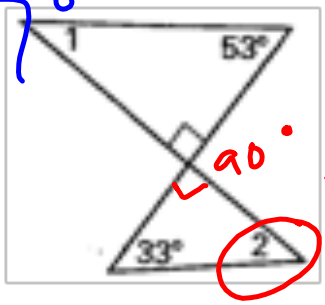
$42 + 90 + ? = 180$

$-42 \quad -90 \qquad -90$

-42

$? = 48°$

$X = 37°$



$Y = 57°$

?

$53° + 90° + ? = 180$

$143 + X = 180$

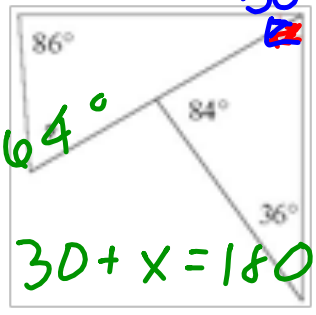
$-143 \qquad -143$

$90 + 33 + X = 180$

$123 + X = 180$

$-123 \qquad -123$

Use the Triangle Sum Theorem to find the missing angles.



30°
60°
64°

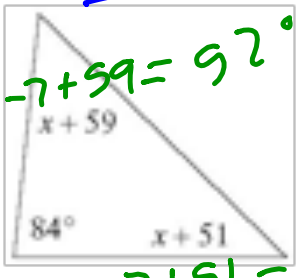
$86 + 30 + x = 180$

$84 + 36 + x = 180$

$120 + x = 180$

$-120 \quad -120$

$x = 60$



$-7 + 59 = 52°$

$-7 + 51 = 44°$

$x + 59 + 84 + x + 51 = 180$

$2x + 194 = 180$

$-194 \quad -194$

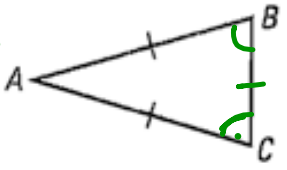
$\frac{2x}{2} = \frac{-14}{2}$

$x = -7$

Isosceles Triangles:

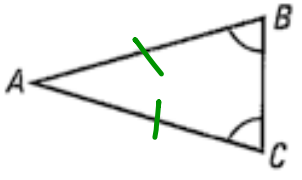
1) If two sides of a triangle are congruent, then the angles opposite them are congruent.

If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong \angle C$.



2) If two angles of a triangle are congruent, then the sides opposite them are congruent.

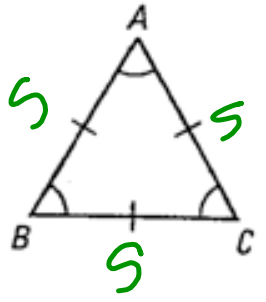
If $\angle B \cong \angle C$, then $\overline{AB} \cong \overline{AC}$.



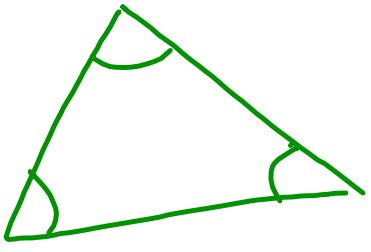
Equilateral Triangles:

1) If a triangle is equilateral, then it is equiangular

2) If a triangle is equiangular, then it is equilateral.



If equilateral triangles are equiangular, what is the measure of each angle in an equilateral triangle?

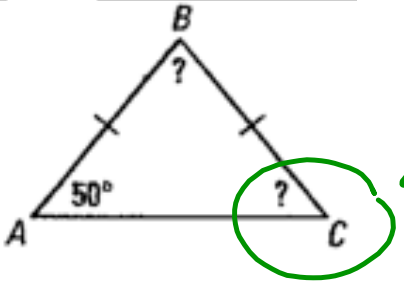


$X + X + X = 180°$

$3X = 180$

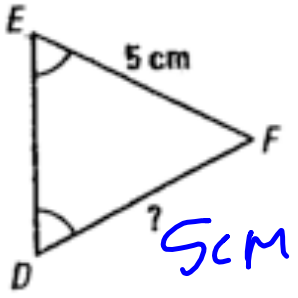
$X = 60°$

Find the unknown measure(s).

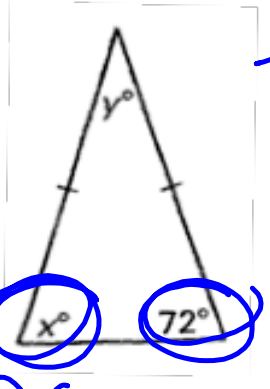


50°

$50 + 50 + B = 180$



5cm



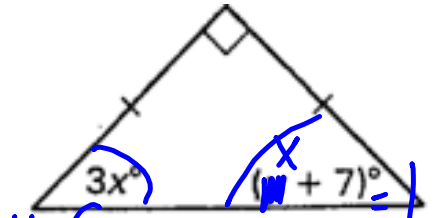
72°

$72 + 72 + y = 180$

$144 + y = 180$

$y = 36°$

Find the measure of the missing angles



10.5 3.5 10.5

$3x + x + 7 + 90 = 180$

$4x + 97 = 180$

$4x = 83$

$x = 3.5$

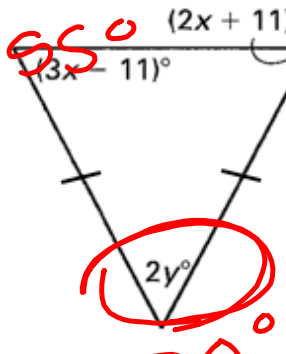
$3x = x + 7$

$2x = 7$

$x = 3.5$

Find the measure of all 3 angles

$3(22)-11$



55° 55° 70°

$55+55+2y=180$

$110+2y=180$

$-110 \quad -110$

$2y=70$

$y=35$

$3x-11=2x+11$

$-2x \quad -2x$

$x-11=11$

$+11 \quad +11$

$x=22$