2.3 Parallel Lines and Triangle Sum

Monday, September 23, 2019 7:46 AM

Warm Up

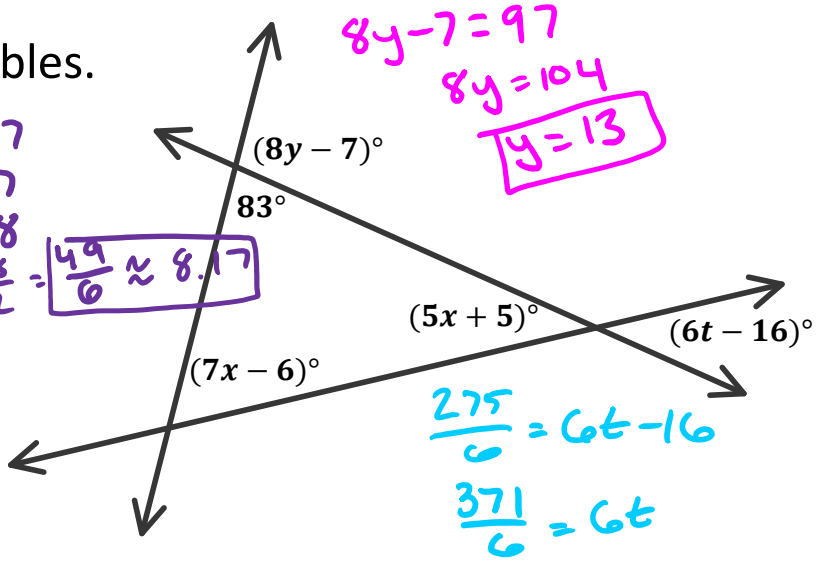
Solve for the variables.

$7x-6+5x+5=97$

$12x-1=97$

$12x=98$

$x=\frac{98}{12}=\frac{49}{6}\approx 8.17$



$8y-7=97$

$8y=104$

$y=13$

$\frac{275}{6}=6t-16$

$\frac{371}{6}=6t$

$10.3\approx\frac{371}{36}=t$

Essential Question

What is true about the interior and exterior angle measures of a triangle?

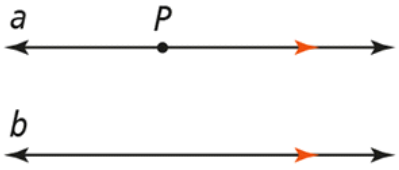
Goal: "I can. . .

Solve problems using the measures of interior and exterior angles of triangles."

THEOREM 2-10

Through a point not on a line, there is one and only one line parallel to the given line.

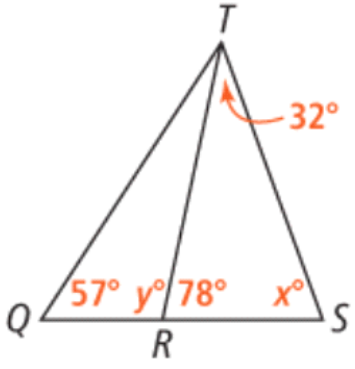
PROOF: SEE EXERCISE 10.

If... 

Then... line *a* is the only line parallel to line *b* through *P*.

EXAMPLE 1

Solve for x and y.



$32+78+x=180$

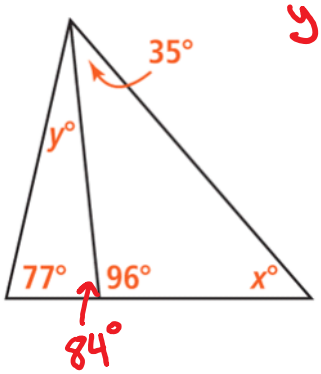
$x+110=180$

$\boxed{x=70}$

$y+78=180$

$\boxed{y=102}$

Solve for x and y. (x and y are different values for the different figures.)



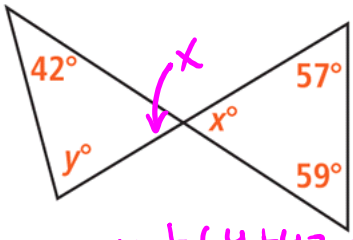
$y+84+77=180$

$y+161=180$

$y=19$

$35+x=84$

$x=49$



$57+59+x=180$

$x+116=180$

$x=64$

$y+64+42=180$

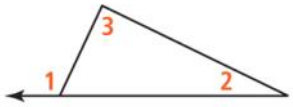
$y+106=180$

$y=74$

Triangle Exterior Angle Theorem

The measure of each exterior angle of a triangle equals the sum of the measures of its two remote interior angles.

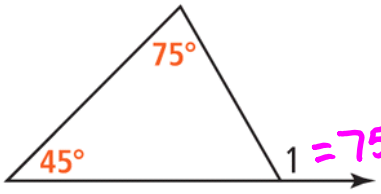
If...



Then... $m\angle 1 = m\angle 2 + m\angle 3$

Example 2

A. What is the missing angle measure in the figure?

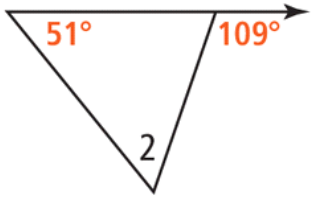


$1=75+45=120$

B. What is the missing angle measure in the figure?

$m\angle 2 = 51$

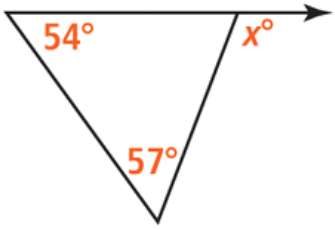
B. What is the missing angle measure in the figure?



$109-51=m\angle 2$

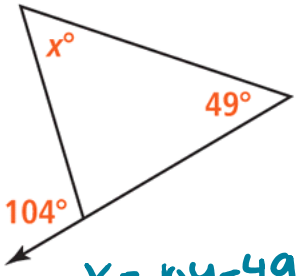
$58=m\angle 2$

Solve for x in each of the figures.



$x=54+57$

$x=111$



$x=104-49$

$x=55$

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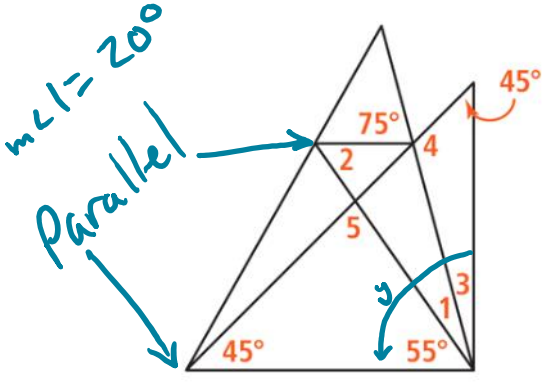
5. What are the measures of $\angle 4$ and $\angle 5$? Explain.



$45+55+m\angle 5=180$

$m\angle 5+100=180$

$m\angle 5=80$

$45+45+y=180$

$y=90$

$m\angle 1+m\angle 3=35$

$20+m\angle 3=35$

$20 + m\angle 3 = 35$
$m\angle 3 = 15$

$m\angle 4 + 45 + 15 = 180$
$m\angle 4 + 60 = 180$
$m\angle 4 = 120$

Homework

Pg. 90
12, 14, 15-27 odd, 30, 33