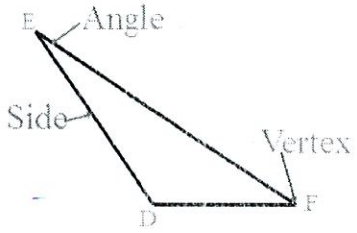
Name_____ Date_____

Day 4 – Triangle Base Angles and Exterior Angles

A **triangle** is a figure formed when three noncollinear (not on the same line) points are connected by segments.



The sides are: $\overline{EF}$, $\overline{ED}$, $\overline{DF}$

The vertices are: E, D, F

The angles are: $\angle E$, $\angle D$, $\angle F$

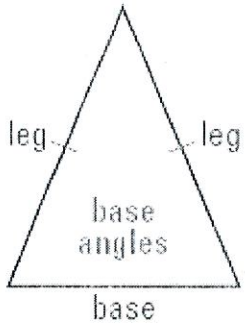
Opposite Side of $\angle F$: $\overline{ED}$

Opposite Side of $\angle E$: $\overline{DF}$

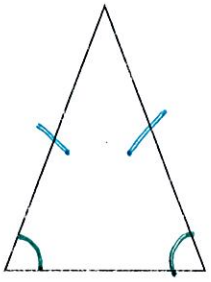
Opposite Side of $\angle D$: $\overline{EF}$

Triangle Sum Theorem: The measures of the three interior angles in a triangle add up to be 180°

Isosceles Base Angle Theorem and Its Converse

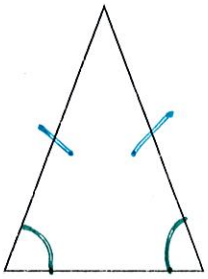


Isosceles Triangle



Base Angles Theorem:

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

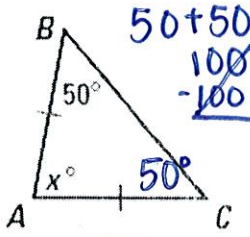


Converse of Base Angles Theorem:

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

Examples:

A. Find the value of x



$50+50+x=180$

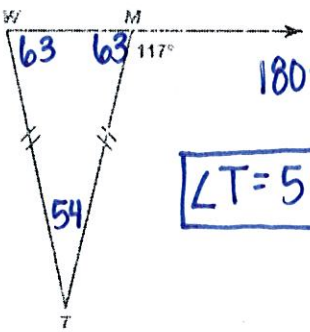
$100+x=180$

$-100 \quad -100$

$x=80$

$x=80$

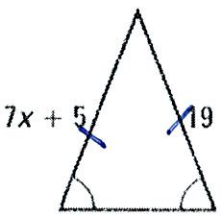
B. Find the m∠T



$180-117=63$

$\angle T=54°$

C. Find the value of x.



$7x+5=19$

$-5 \quad -5$

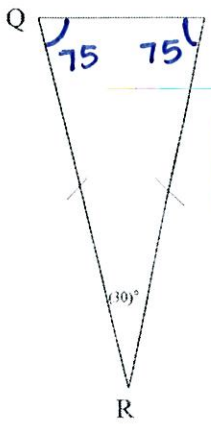
$7x=14$

$\frac{7x}{7}=\frac{14}{7}$

$x=2$

D. Find the measure of <P. E. Find the measure of ∠Q F. Find the value of x & y.

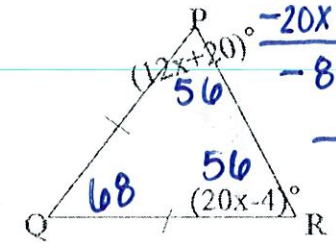
∠R = 30°



180 − 30 = 150

$\frac{150}{2} = 75$

∠P = 75°



$12x + 20 = 20x - 4$

$-20x \quad -20x$

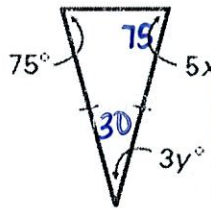
$-8x + 20 = -4$

$-20 \quad -20$

$\frac{-8x}{-8} = \frac{-24}{-8}$

$x = 3$

∠Q = 68°



$\frac{5x}{5} = \frac{75}{5}$

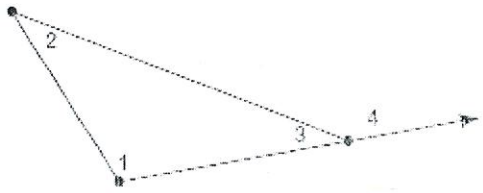
x = 15

$\frac{3y}{3} = \frac{30}{3}$

y = 10

Exterior Angle Theorem

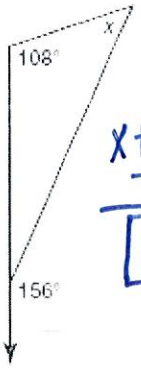
Exterior angle theorem: The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles of the triangle.



$m\angle 1 + m\angle 2 = m\angle 4$

Examples:

A.

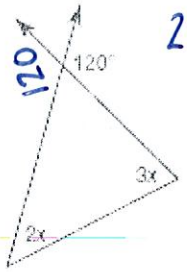


$x + 108 = 156$

$-108 \quad -108$

x = 48

B.

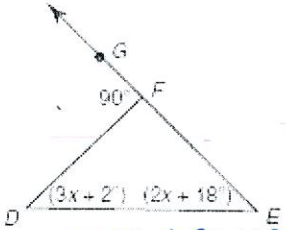


$2x + 3x = 120$

$\frac{5x}{5} = \frac{120}{5}$

x = 24

C.



$3x + 2 + 2x + 18 = 90$

$5x + 20 = 90$

$-20 \quad -20$

$\frac{5x}{5} = \frac{70}{5}$

x = 14