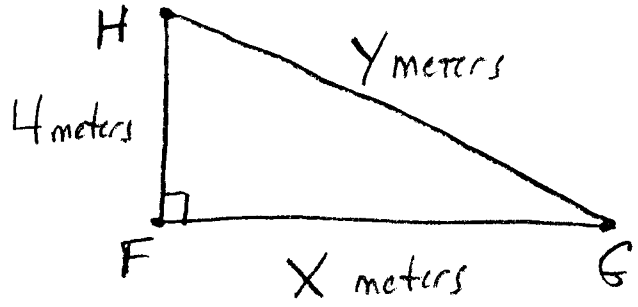
BE - Geometry 1

Tuesday 10-11-11

ACT ① For $\triangle FGH$, write an expression for y in terms of X.



ANS

$$Y^2 = 4^2 + X^2$$

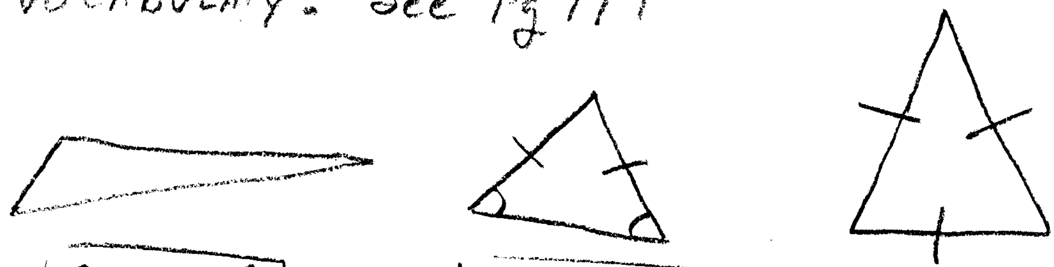
$$Y^2 = X^2 + 16$$

$$\boxed{Y = \sqrt{X^2 + 16}}$$

Note: mathematically $y = \pm\sqrt{X^2+16}$ but the negative answer is eliminated because distance is always positive.

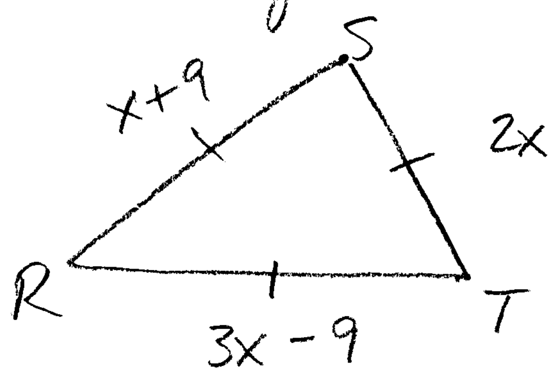
Ch. 4-1 Classifying Triangles

Vocabulary: See Pg 179



SCALENE	ISOSCELES	EQUILATERAL
NO SIDE CONGRUENT	2 SIDES $\cong$	3 SIDES $\cong$
	2 $\angle$s $\cong$	3 $\angle$s $\cong 60°$
		= EQUIANGULAR

Ex 3 Pg 179 Find X and the measure of each side of equilateral $\triangle RST$



Any 2 sides must be $\cong$

$$\begin{aligned} x+9 &= 3x-9 \\ -x \quad & \quad -x \\ 18 &= 2x \\ 9 &= x \end{aligned}$$

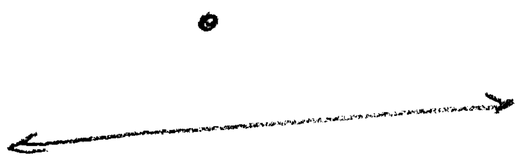
or

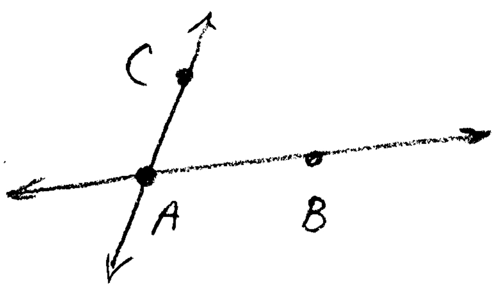
$$\begin{aligned} x+9 &= 2x \\ -x \quad & \quad -x \\ 9 &= x \end{aligned}$$

$$\therefore \boxed{\begin{aligned} \overline{RS} &= 18 \\ \overline{RT} &= 18 \\ \overline{ST} &= 18 \end{aligned}}$$

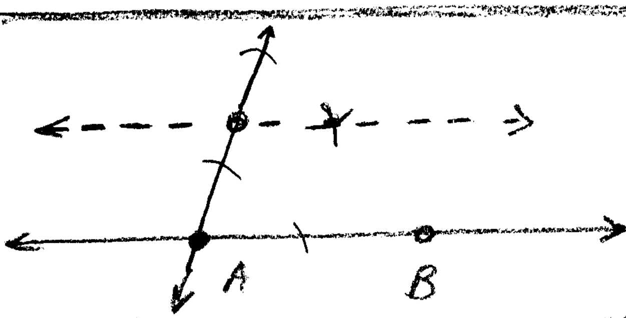
Recall: * This is called the "Parallel Postulate"

You can construct a parallel to any line though a point not on the line by drawing a line and copying an angle:

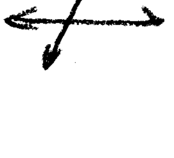




Copy ∠BAC to new vertex at C



New // line

Recall properties of Parallel lines cut by a Transversal 

Corr. ∠s are ≅

Alt. Int. and Ext ∠s are ≅

Consec. Int and Ext ∠s are supplementary

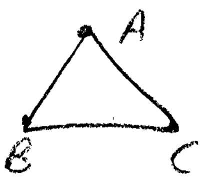
Using the information we have already proven, we are going to prove that the sum of the 3 angles in a $\triangle$ is always 180 degrees. $\boxed{\text{Theorem 4.1 Ch. 4-2}}$

Ch. 4-2 Angles of Triangles

Two Column Proof:

Given: STATE WHAT THE "STARTING" problem or geometric situation is.

(EX) Given: Any triangle



Prove: STATE WHAT IS TO BE proved

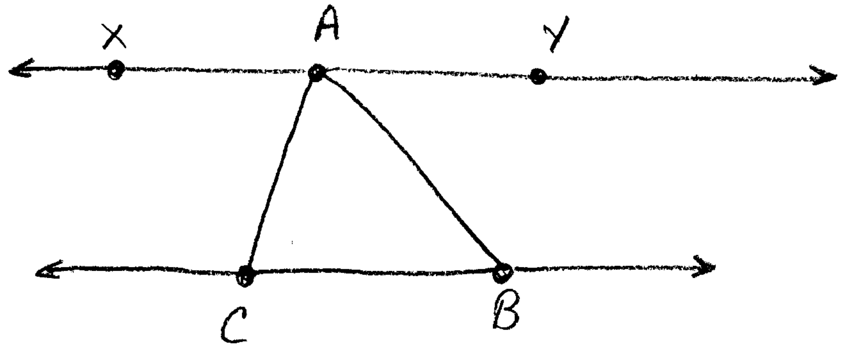
(EX) $m\angle A + m\angle B + m\angle C = 180^0$

Statements	Reasons
1. Numbered statements that lead from given to final proof	1. THE JUSTIFICATION THAT each statement is true.
2. ⋮	2. ⋮
(N) $m\angle A + m\angle B + m\angle C = 180^0$	(N) FINAL STATEMENT THAT SHOWS that WHAT IS TO BE PROVED is true

<u>PROVE</u>: THE SUM OF THE $\angle$S IN A $\triangle$ = 180°

GIVEN: Some $\triangle ABC$ C$\triangle$B (A)

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



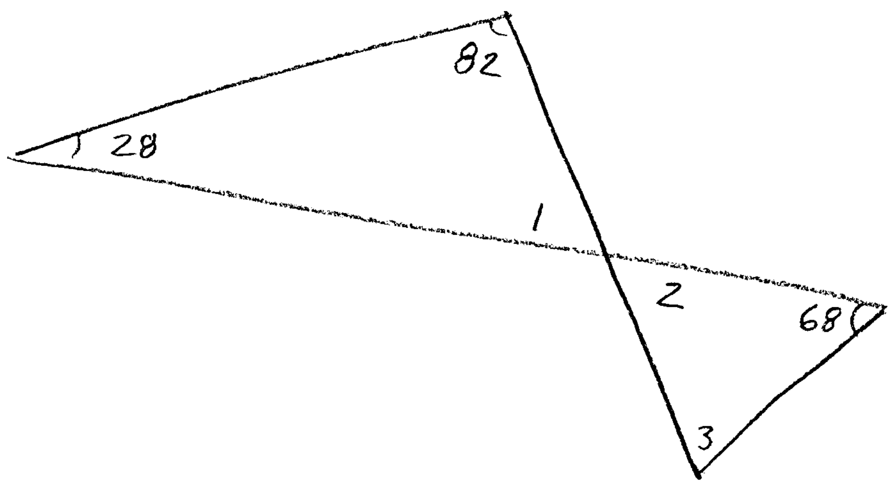
① $\triangle ABC$	① GIVEN
② CONSTRUCT $\overline{XY}$ THROUGH A AND Parallel to $\overline{BC}$	② Can Construct parallel TO ANY LINE Through POINT NOT ON LINE <u>OR</u> Parallel POSTULATE
③ $m\angle XAC + m\angle CAY = 180^\circ$	③ $\angle XAC + \angle CAY$ form A linear pair $\Rightarrow$ Supplementary
④ $m\angle XAC = m\angle ACB$	④ ALT. INT. $\angle$S $\cong$
⑤ $m\angle ABC = m\angle BAY$	⑤ ALT INT $\angle$S $\cong$
⑥ $m\angle CAY = m\angle BAC + m\angle BAY$	⑥ DEFINITION
⑦ $m\angle ACB + m\angle BAC + m\angle ABC = 180^\circ$	⑦ SUBSTITUTION, QED LATIN THE THING IS PROVED

$$m\angle XAC + m\angle CAY$$

$$m\angle ACB + m\angle BAC + m\angle ABC = 180^\circ$$

If you know 2 ∠s in a △, you can find the third.

(Ex1) Find the missing angle measure.



$m\angle 1 = 180^\circ - (82+28)$

$= 180 - 110 = \boxed{70^\circ = m\angle 1}$

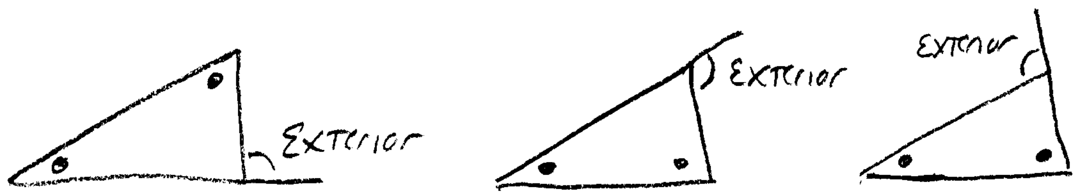
$\therefore \boxed{m\angle 2 = 70^\circ}$ Vertical ∠s

$\therefore m\angle 3 = 180 - (68+70)$

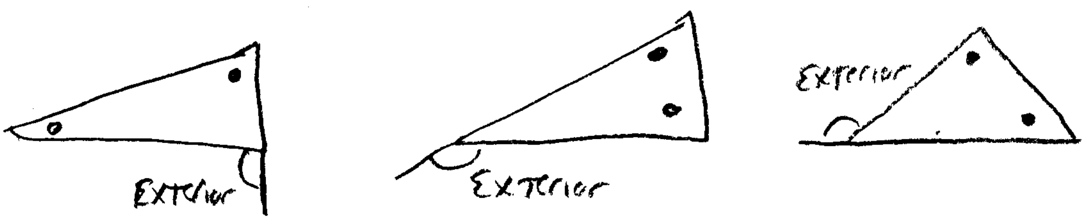
$= 180 - 138 = \boxed{42^\circ = m\angle 3}$

Vocabulary

If you extend any side of a $\triangle$, the **exterior angle** is the one outside the $\triangle$. The 2 $\angle$s inside that are **NOT** adjacent (next to) to the exterior angle are called the 2 remote interior $\angle$s



• Remote interiors.



Theorem 4-3 (Pg 186): The sum of the 2 remote interior $\angle$s equals the measure of the exterior $\angle$

Homework: Pg. 188–189 # 3–10