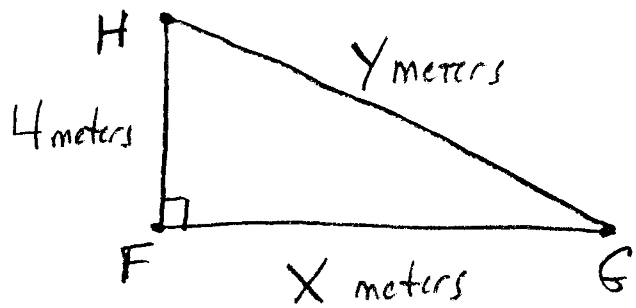
BE - Geometry 1 | Monday 10-4-10

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



ANS |

$$y^2 = 4^2 + x^2$$

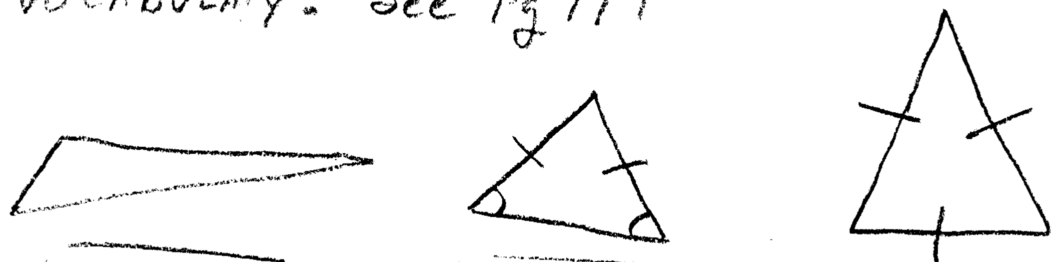
$$y^2 = x^2 + 16$$

$$\boxed{y = \sqrt{x^2+16}}$$

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

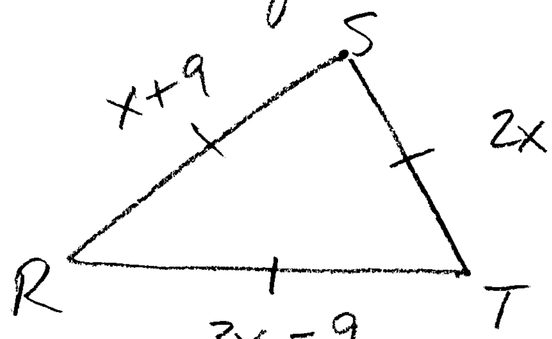
Ch. 4-1 Classifying Triangles

Vocabulary: See Pg 179



SCALENE	ISOSCELES	EQUILATERAL
NO SIDE CONGRUENT	2 SIDES $\cong$	3 SIDES $\cong$
	2 $\angle$s $\cong$	3 $\angle$s $\cong 60^\circ$
		$=$ $\boxed{\text{EQUIANGULAR}}$

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



Any 2 sides must be $\cong$

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

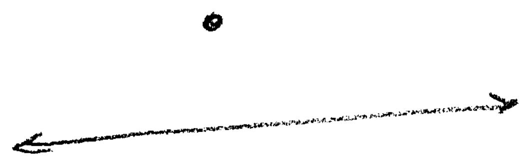
or

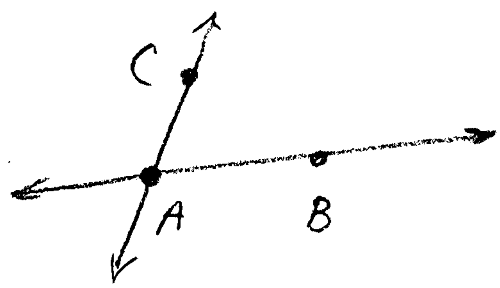
$$\begin{aligned} x+9 &= 2x \\ -x \quad &\quad -x \\ 9 &= x \end{aligned}$$

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

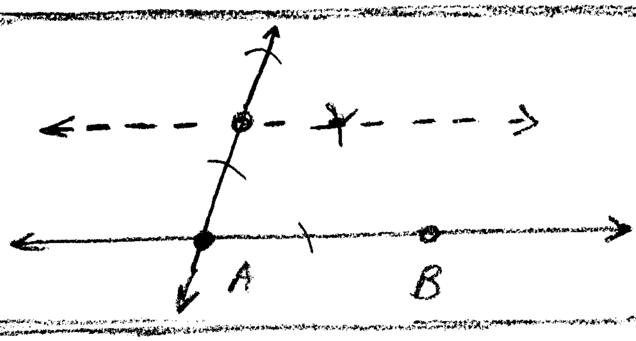
RECALL: * {THIS is called the "PARALLEL POSTULATE"}

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



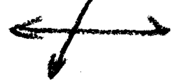


Copy $\angle BAC$ to new vertex at C



New // line

Recall properties of parallel lines cut by a transversal



Corr. $\angle$s are $\cong$

Alt. Int. and Ext $\angle$s are $\cong$

Consec. Int and Ext $\angle$s are supplementary

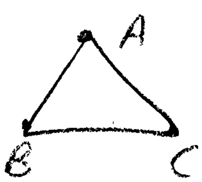
Using the information we have already proven, we are going to prove that the sum of the 3 angles in a $\triangle$ is always 180 degrees. $\boxed{\text{Theorem 4.1 Ch. 4-2}}$

Ch. 4-2 Angles of Triangles

Two Column Proof:

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

(EX) Given: Any triangle

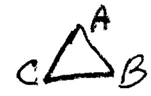


Prove: STATE WHAT IS TO BE proved

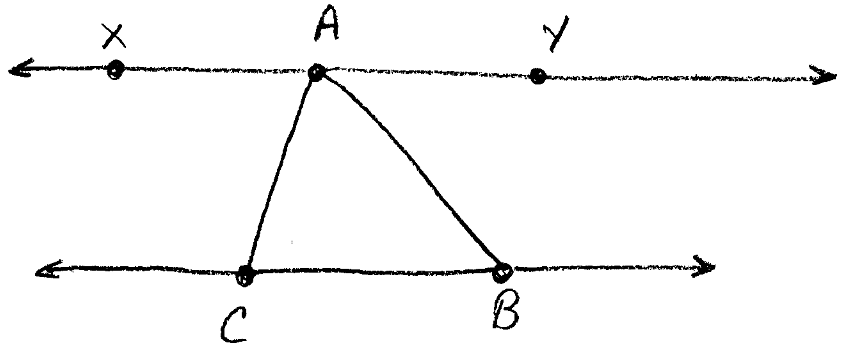
(EX) $m\angle A + m\angle B + m\angle C = 180^\circ$

Statements	Reasons
1. Numbered statements that lead from given to final proof	1. The justification that each statement is true.
2. ⋮	2. ⋮
(N) $m\angle A + m\angle B + m\angle C = 180^\circ$	(N) Final statement that shows that what is to be proved is true

Prove: The sum of the ∠s in a △ = 180°

Given: Some △ABC 

Prove: $m\angle A + m\angle B + m\angle C = 180°$



① △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 **or** Parallel Postulate
③ $m\angle XAC + m\angle CAY = 180°$	③ ∠XAC + ∠CAY form a linear pair ⇒ supplementary
④ $m\angle XAC = m\angle ACB$	④ Alt. int. ∠s ≅
⑤ $m\angle ABC = m\angle BAY$	⑤ Alt int ∠s ≅
⑥ $m\angle CAY = m\angle BAC + m\angle BAY$	⑥ Definition
⑦ $m\angle ACB + m\angle BAC + m\angle ABC = 180°$	⑦ Substitution, QED

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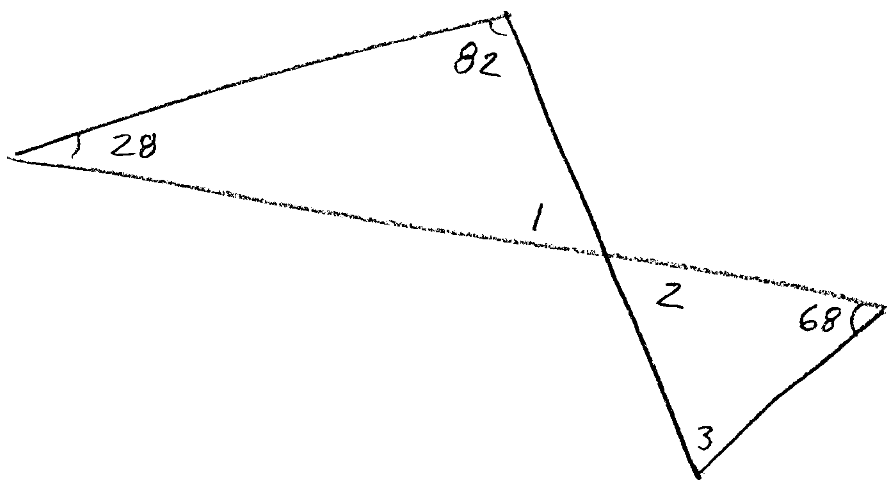
The thing is proved

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

$$m\angle ACB + m\angle BAC + m\angle ABC = 180°$$

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

(Ex1) FIND THE MISSING Angle measure.



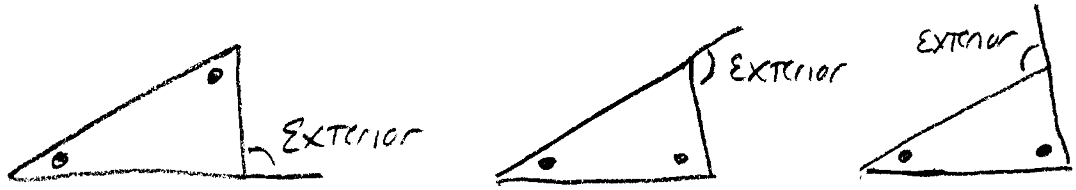
$m\angle 1 = 180° - (82 + 28)$
$= 180 - 110 = \boxed{70° = m\angle 1}$

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

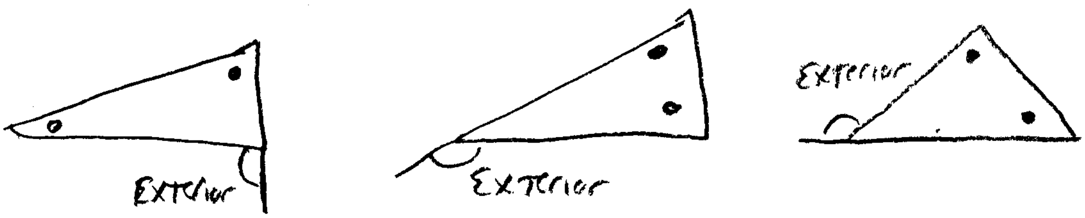
$\therefore m\angle 3 = 180 - (68 + 70)$
$= 180 - 138 = \boxed{42° = m\angle 3}$

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 The sum of the 2 remote interior $\angle$s equals the measure of the exterior $\angle$

Pg 186

Homework: Pg. 188–189 # 3–10