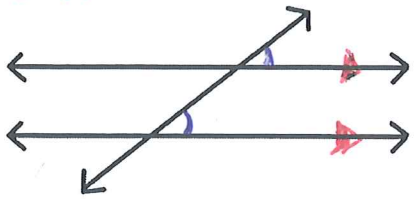
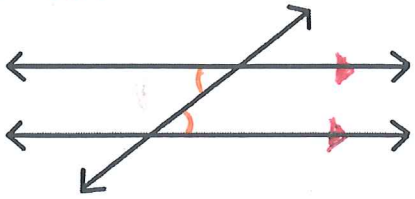
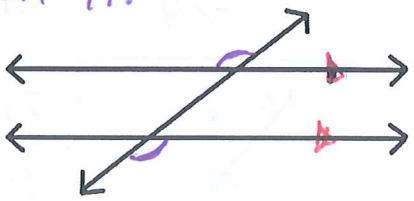
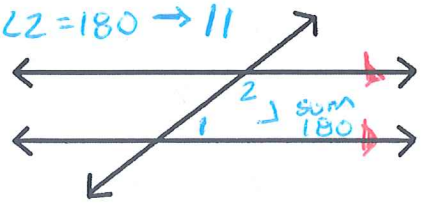
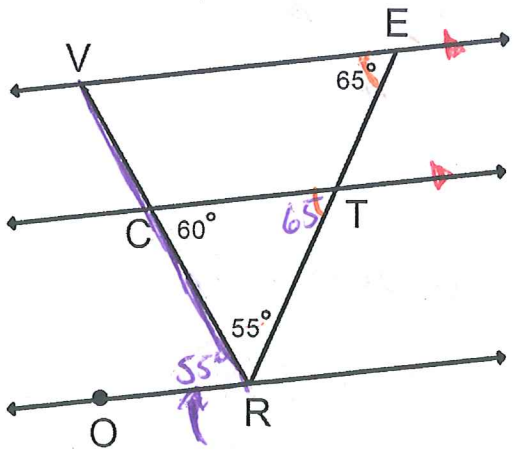
Geometry - 3.5 - Proving Lines are Parallel

Converse Corresponding ∠'s	Converse of (AIA)
If corr. ∠'s are ≅ then ∥ 	If AIA are ≅ then ∥. 
Converse AEA	**Converse of (CIA)**
If AEA are ≅ then ∥. 	If CIA are supplementary then ∥. ∠1 + ∠2 = 180 → ∥ 

Ex 1 - In the figure below, $\overline{RV}$ bisects ∠ORE. Determine which lines, if any, are parallel.



Def of ∠ Bisector

55 + 55

110

60
55
115

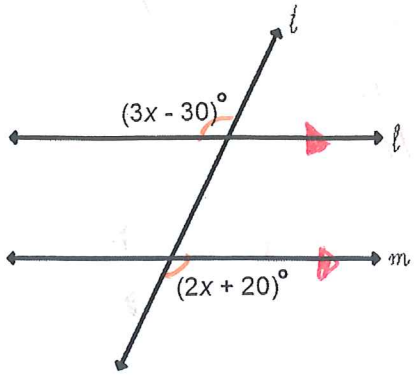
115 + x = 180
-115 -115
x = 65

$\overleftrightarrow{VE} \parallel \overleftrightarrow{CT}$ by converse of Corr. ∠'s

OR $\overleftrightarrow{R} \nparallel \overleftrightarrow{CT}$ by Converse of CIA.

110
+65
175

Ex 2 - In the figures below, find x so that $\ell \parallel m$.



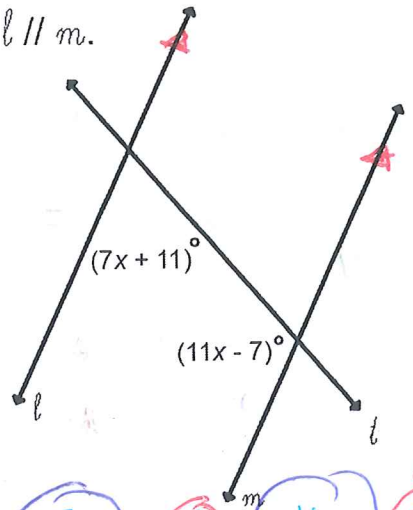
$3x - 30 = 2x + 20$

$+30 \quad +30$

$3x = 2x + 50$

$-2x \quad -2x$

$x = 50$



$(7x) + (11) + (11x) + (-7) = 180$

$18x + 4 = 180$

$-4 \quad -4$

$18x = 176$

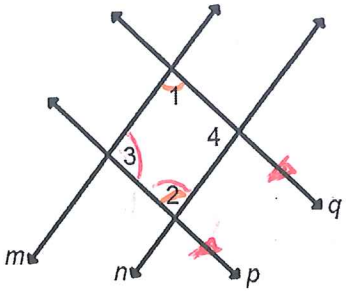
$\frac{18x}{18} = \frac{176}{18}$

$x = \frac{88}{9}$

Ex 3:

Given: $p \parallel q$
$\angle 1 \cong \angle 2$

Prove: $m \parallel n$



(1) $p \parallel q$, $\angle 1 \cong \angle 2$	(1) Given
(2) $m\angle 1 + m\angle 3 = 180$	(2) Def CIA
(3) $m\angle 1 = m\angle 2$	(3) Def of $\cong$ $\angle$'s
(4) $m\angle 2 + m\angle 3 = 180$	(4) Substitution
(5) $m \parallel n$	(3) Converse of CIA