# Angles and Parallel Lines Notes

## (Lessons 3.2 and 3.5)

## Goals:

- *You will determine the relationship between special angle pairs.*
- *You will use algebra to find angle measures.*

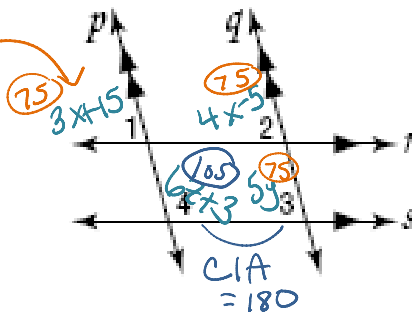| If 2 parallel lines are cut by a transversal, their… | | | |
|---|:---:|:---:|---|
| | $\cong$ | **supplementary** | Theorem Name |
| Alternate Interior Angles are | ✓ | | Alternate Interior Angles Theorem |
| Alternate Exterior Angles are | ✓ | | Alternate Exterior Angles Theorem |
| Consecutive Interior Angles are | | ✓ | Consecutive Interior Angles Theorem |
| Corresponding Angles are | ✓ | | Corresponding Angles Postulate |
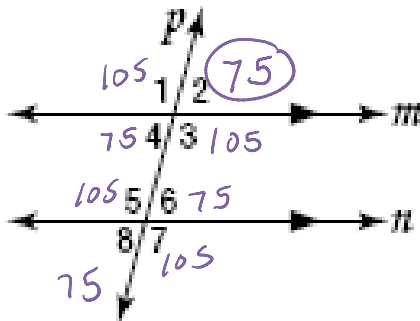


Examples:

1.) If the m∠2 = 75, find the measure of all the remaining angles.

If $m\angle 1 = 3x + 15$, $m\angle 2 = 4x - 5$, $m\angle 3 = 5y$,
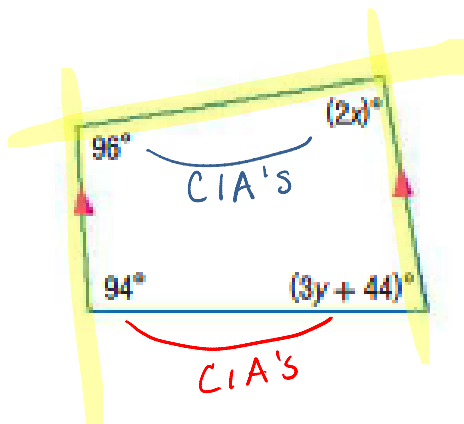
2.) and $m\angle 4 = 6z + 3$, find $x$ and $y$, and $z$

Corr

$3x+15=4x-5$

$\boxed{20 = x}$

$p \uparrow$   $q \uparrow$

㊄ $3x+15$  ㊄ $4x-5$  $\rightarrow r$
  1         2

㊄ ㊄
$6z+3$ $5y$  $\rightarrow s$
  4      3

CIA $= 180$

CIA $+180$

$6z+3 = 105$

$6z = 102$

$\boxed{z=17}$

$\angle 2$ corr w/ $\angle 3$ ≅

$\dfrac{75}{5} = \dfrac{5y}{5}$
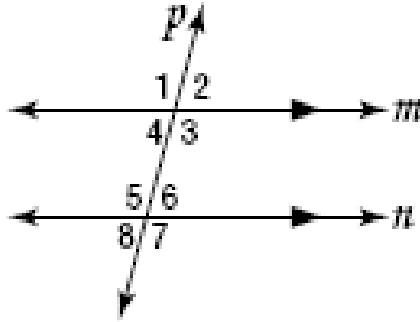
$\boxed{15 = y}$

3.) Find x and y.

$96°$   $(2x)°$

CIA'S

$94°$   $(3y+44)°$

CIA'S

$96 + 2x = 180$

$2x = 84$

$\boxed{x = 42}$

$94 + 3y + 44 = 180$

$3y + 138 = 180$

$3y = 42$

$\boxed{y = 14}$

*Converse*

If 2 lines are cut by a transversal, and their…

|  | $\cong$ | supplementary | | Theorem Name |
|---|---|---|---|---|
| Alternate Interior Angles are | ✓ | | | Alternate Interior Angles Converse |
| Alternate Exterior Angles are | ✓ | | | Alternate Exterior Angles Converse |
| Consecutive Interior Angles are | | ✓ | **Then their lines are parallel.** | Consecutive Interior Angles Converse |
| Corresponding Angles are | ✓ | | | Corresponding Angles Converse |

**Example 1**  If $m\angle 1 = m\angle 2$,
determine which lines, if any, are
parallel.
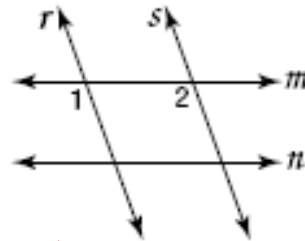
$r \parallel s$, Corr $\angle$'s Converse

**Example 2**  Find $x$ and $m\angle ABC$
so that $m \parallel n$.

$(3x + 10)°$

$(6x - 20)°$

$40$
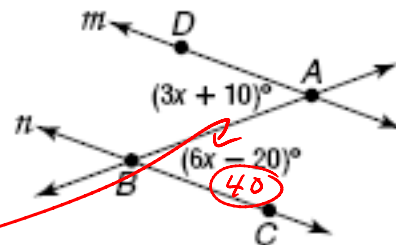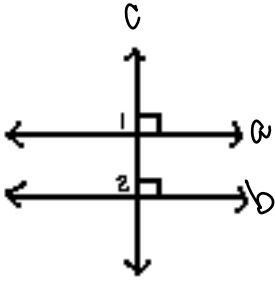
$3x + 10 = 6x - 20$

$30 = 3x$

$10 = x$

Perpendicular Transversal Theorem & its converse

- ✦ If one line is perpendicular to one of 2 ‖ lines, then it is perpendicular to the other line.

- ✦ If two lines are perpendicular to the same line, then the lines are parallel.



## Goals:

- *You can determine the relationship between special angle pairs.*
- *You can use algebra to find angle measures.*

## Parking Lot Problem Task:

Your company, Stripe Masters, has been asked to paint the stripes for a parking lot for "High Value Investments".



Here are the conditions:

- You will be drawing a scaled down version of the parking lot to practice the real thing.
- The following tools may be used: side walk chalk, a protractor, and a ruler.
- To do this, you will draw 6 parking spaces… 8 inches between the parallel lines and 12 inch deep spaces. (Real parking space is 8 ft wide and 12 ft long)
- The transversal line CANNOT be perpendicular to the parallel lines.

Keep in mind: What will you do to make sure your lines are truly parallel using only the protractor, ruler, and sidewalk chalk? You cannot just draw two lines and say they look parallel, so they are ☺