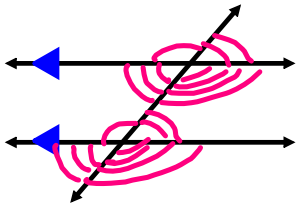
3.2 USE PARALLEL LINES AND TRANSVERSALS

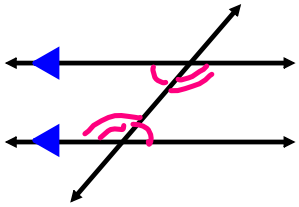
Postulate 15: Corresponding Angles Postulate

If two parallel lines are cut by a transversal, then each pair of corresponding angles is congruent.



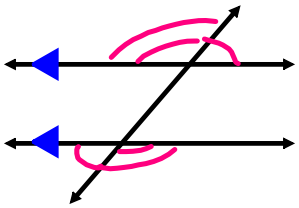
Theorem 3.1: Alternate Interior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of alternate interior angles is congruent.



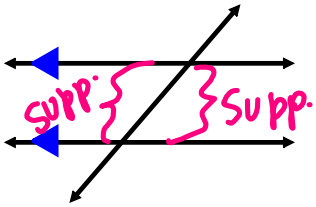
Theorem 3.2: Alternate Exterior Angles Theorem

If two parallel lines are cut by a transversal,
then each pair of alternate exterior angles is congruent.



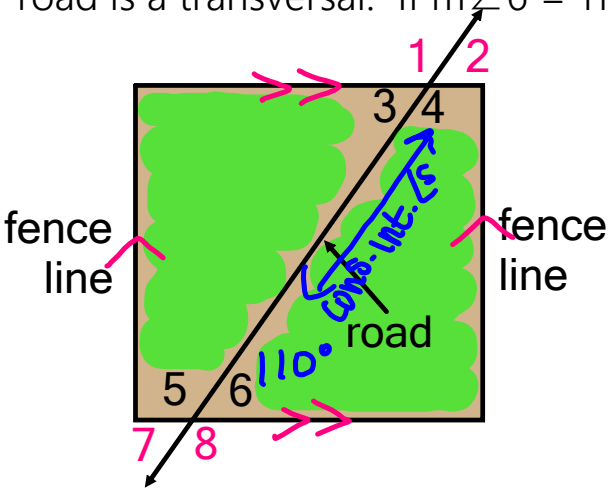
Theorem 3.3: Consecutive Interior Angles Theorem

If two parallel lines are cut by a transversal,
then each pair of consecutive interior angles is supplementary.



Example 1

The road displayed in the diagram divides a farm into two parts. The opposite edges of the field are parallel, and the road is a transversal. If m∠6 = 115, find m∠3.



∠6 & ∠3 → alt. int. ∠s

m∠3 = 115°

Example 2

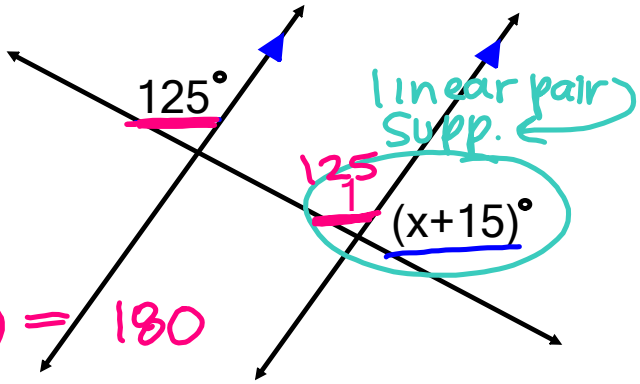
Find m∠1 if m∠6 = 110.

m∠4 = 70

m∠1 = 70°

Example 3

Find the value of x.



$125 + (x+15) = 180$

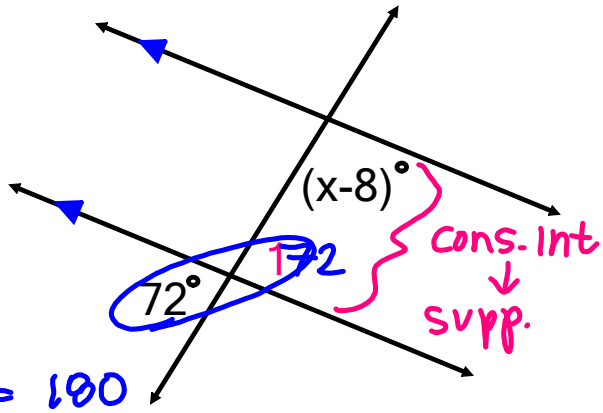
$x + 140 = 180$

$-140 \quad -140$

$x = 40$

Example 4

Find the value of x.



$72 + (x-8) = 180$

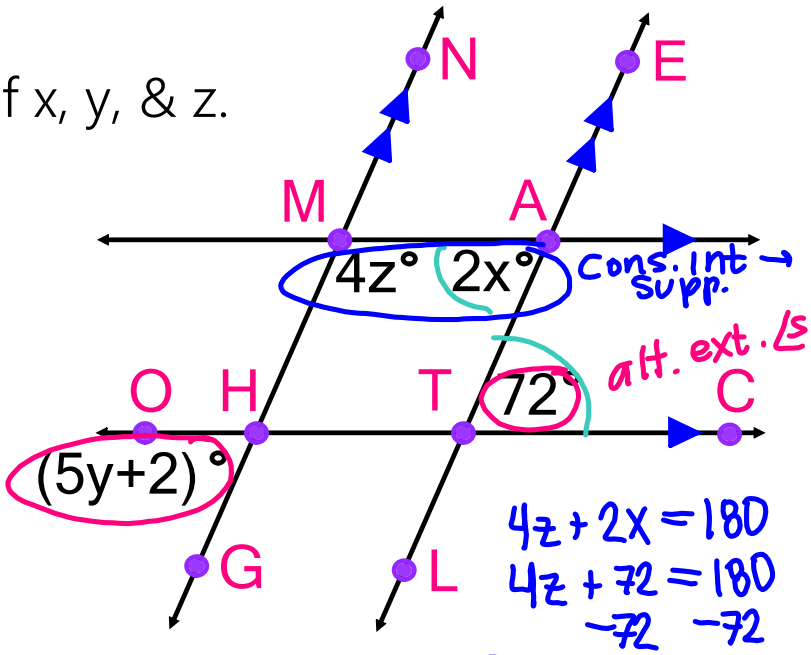
$x + 64 = 180$

$-64 \quad -64$

$x = 116$

Example 5

Find the values of x, y, & z.



$\frac{2x}{2} = \frac{72}{2}$

$x = 36$

$5y + 2 = 72$

$-2 \quad -2$

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

$y = 14$

$4z + 2x = 180$

$4z + 72 = 180$

$-72 \quad -72$

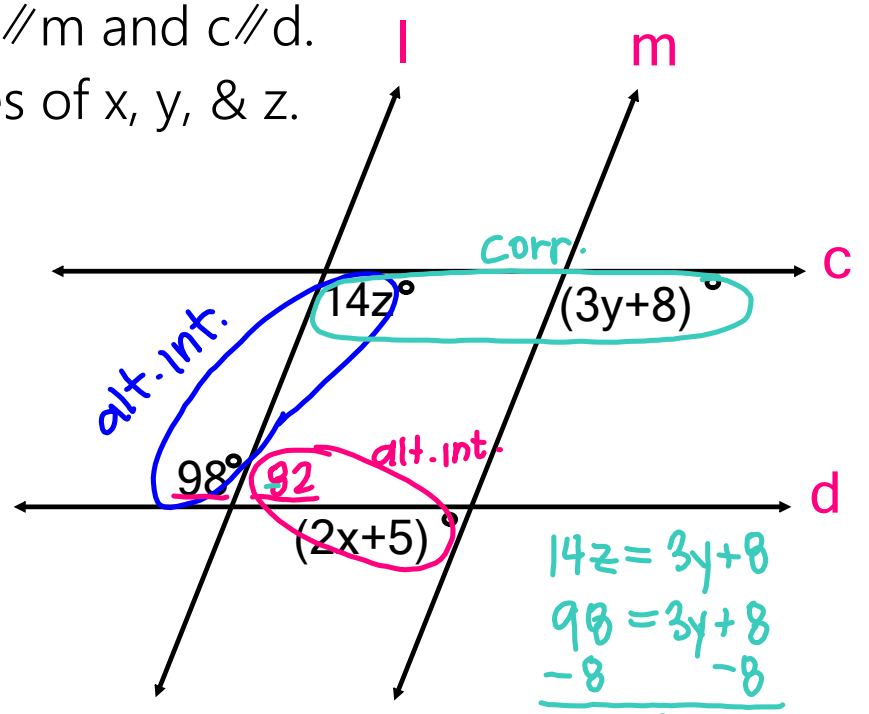
$\frac{4z}{4} = \frac{108}{4}$

$z = 27$

Example 6

In the figure, l ∥ m and c ∥ d.

Find the values of x, y, & z.



$\frac{14z}{14} = \frac{98}{14}$

$z = 7$

$2x + 5 = 82$

$-5 \quad -5$

$\frac{2x}{2} = \frac{77}{2}$

$x = \frac{77}{2}$

$14z = 3y + 8$

$98 = 3y + 8$

$-8 \quad -8$

$\frac{90}{3} = \frac{3y}{3}$

$y = 30$