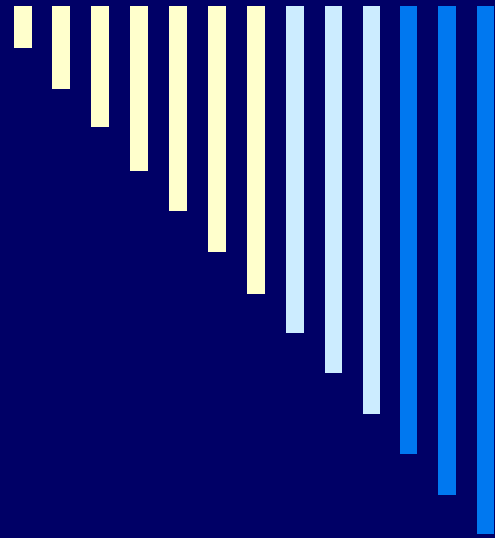
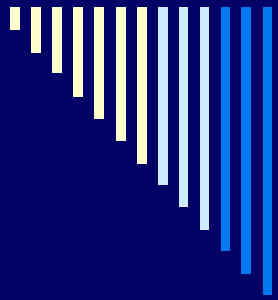




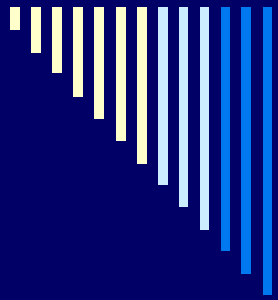
Notes for Lesson 3-3

Proving Lines Parallel



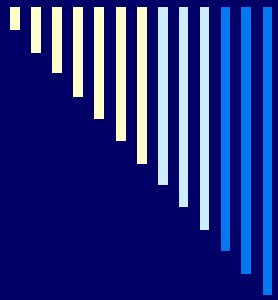
Postulate 11

- If two lines are cut by a transversal and corresponding angles are congruent, then the lines are parallel.



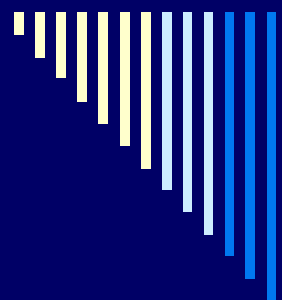
Theorem 3-5

- If two lines are cut by a transversal and alternate interior angles are congruent, then the lines are parallel.



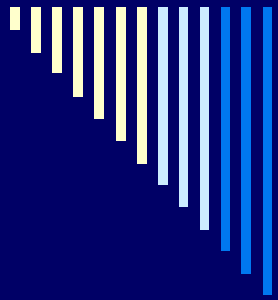
Theorem 3-6

- If two lines are cut by a transversal and same-side interior angles are supplementary, then the lines are parallel.



Theorem 3-7

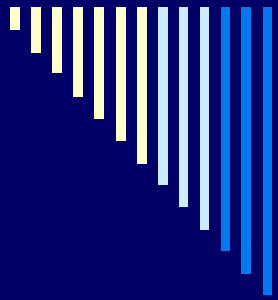
- In a plane two lines perpendicular to the same line are parallel.



Theorem 3-8

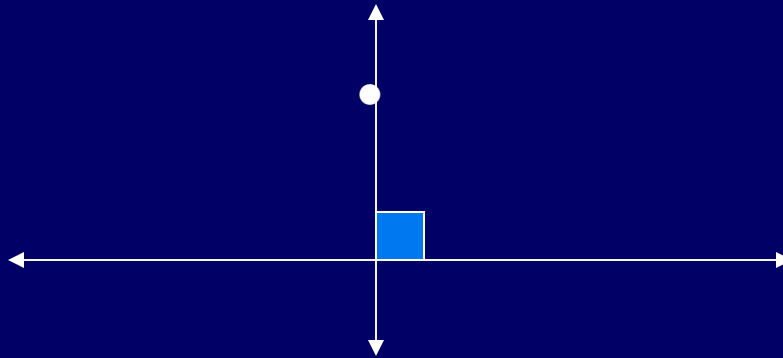
- Through a point outside a line, there is exactly one line parallel to the given line.

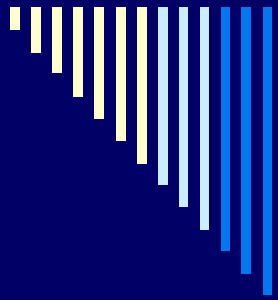




Theorem 3-9

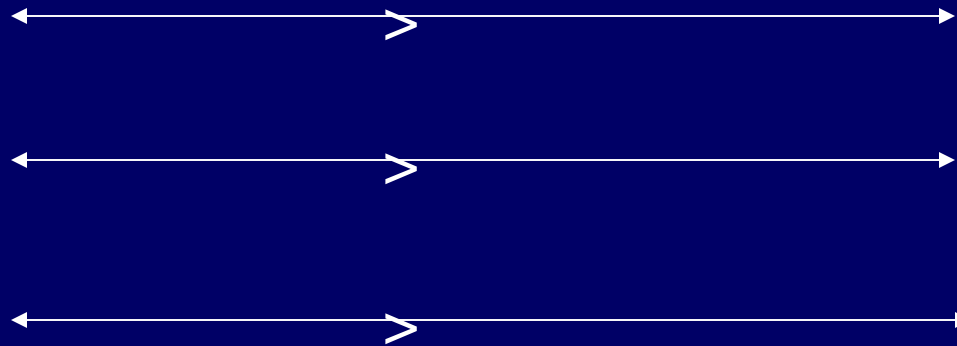
- Through a point outside a line, there is exactly one line perpendicular to the given line.





Theorem 3-10

- Two lines parallel to a third line are parallel to each other



Example 1

□ Name the lines (if any) that may be parallel based on the given information.

A) $\angle 1$ is congruent to $\angle 8$

answer: $j \parallel k$

A) $\angle 4$ is congruent to $\angle 6$

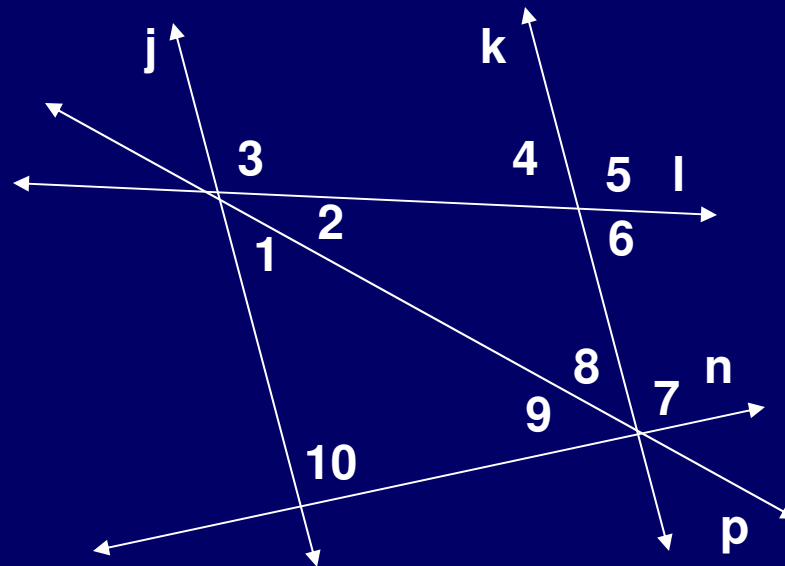
answer: none

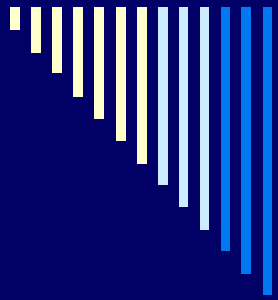
A) $\angle 10$ is congruent to $\angle 7$

answer: $j \parallel k$

A) $m\angle 3 + m\angle 4 = 180^\circ$

answer: $j \parallel k$





Example 2

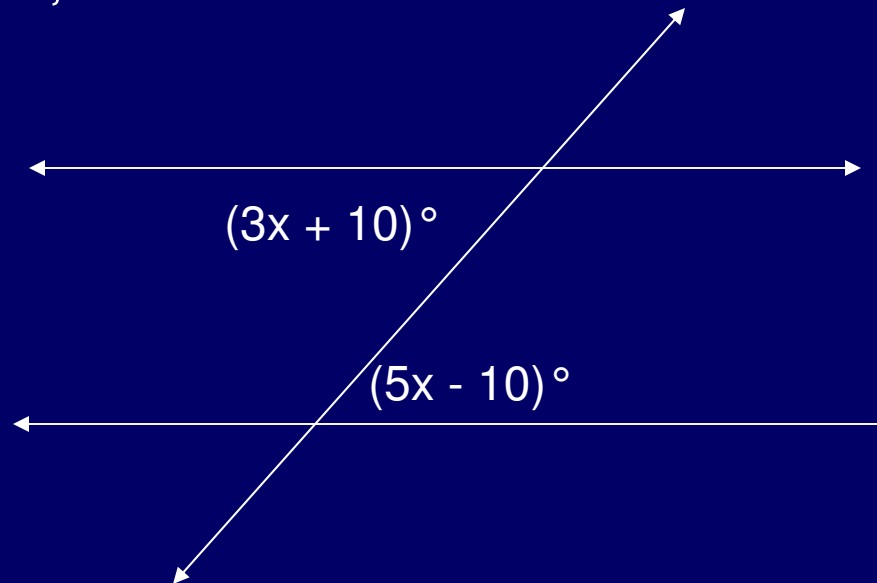
□ Solve

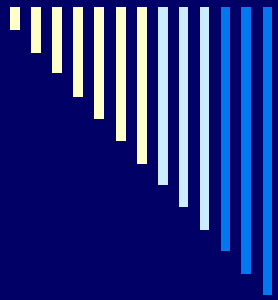
Given that the two horizontal lines are parallel, solve for x .

$$3x + 10 = 5x - 10$$

$$20 = 2x$$

$$10 = x$$





Example 3

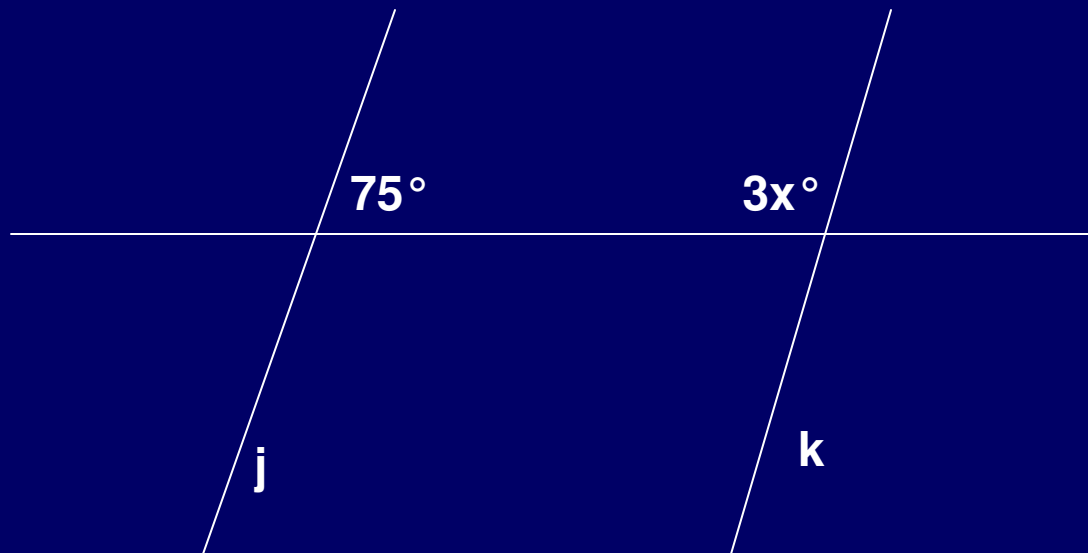
□ Solve

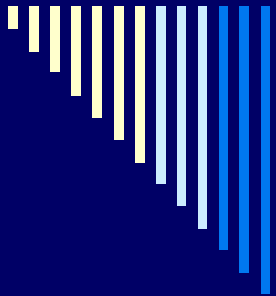
Given $j \parallel k$, solve for x .

$$3x + 75 = 180$$

$$3x = 105$$

$$x = 35$$





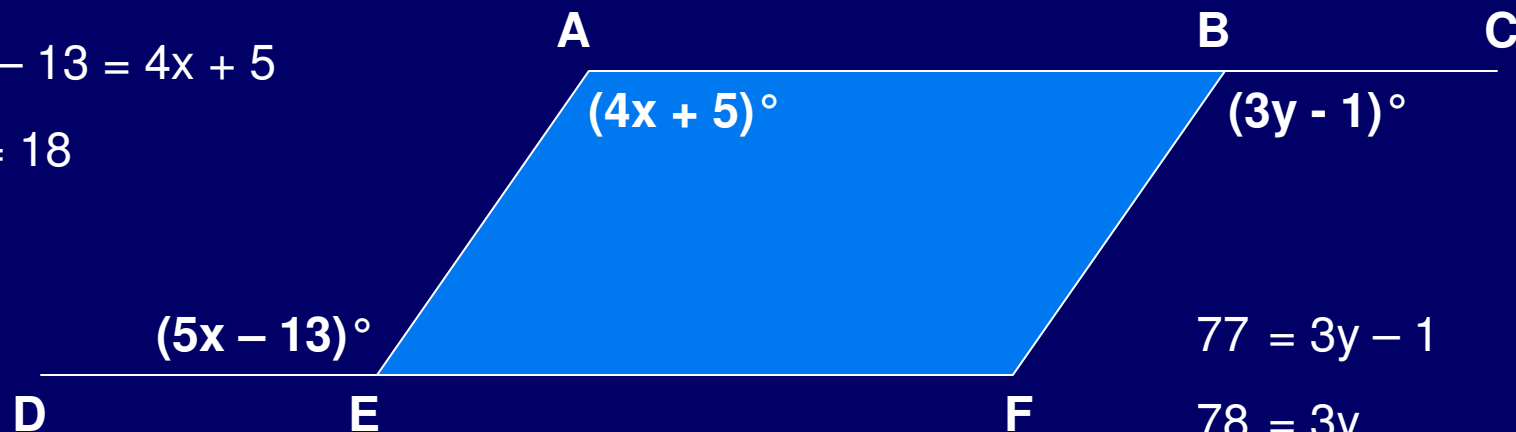
Example 4

□ Solve

Given that line $AE \parallel$ line BF and line $EF \parallel$ line AB , solve for x and y

$$5x - 13 = 4x + 5$$

$$x = 18$$



$$77 = 3y - 1$$

$$78 = 3y$$

$$26 = y$$