Name: Key

Geometry

October 22, 2012

Angles formed by parallel lines

Solving for Angles of Parallel Lines

Below are 2 example problems. Look over the examples to help you complete the assignment. Follow these steps for each problem:

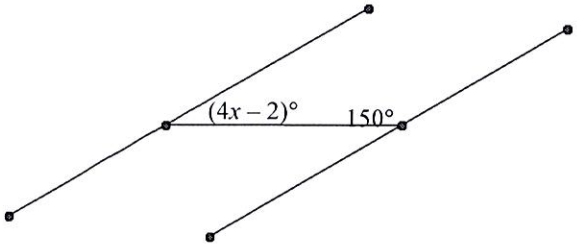
1. Determine the special type of angles that are given: alternate interior, alternate exterior, corresponding, same-side interior, or vertical.

2. Use your notes and knowledge of parallel lines and angles to figure out the relationship between the angles: Are they congruent or supplementary?

3. Write an equation that represents the relationship. If the angles are supposed to be congruent, set them equal to each other. If the angles are supposed to be supplementary, then add them together, and set it equal to 180°.

4. Use your solution, if necessary, to answer any follow up questions.

Example #1



$4x-2+150=180$ By the consec. int. ∠'s Thm.

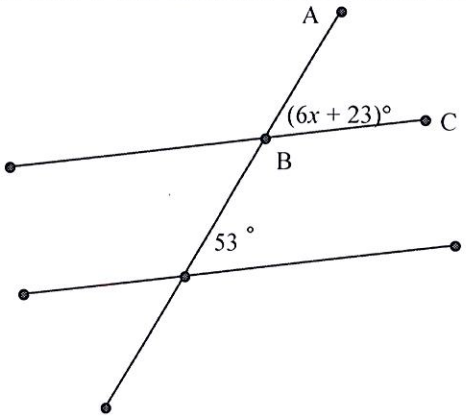
$4x+148=180$

$4x=32$

$x=8$

Example #2

Solve for x and then find the measure of $\angle ABC$.



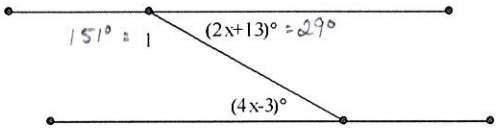
$6x+23=53$ by the corresponding ∠'s Post.

$6x=30$

$x=5$

$m\angle ABC = 6(5)+23 = 53°$

5. Solve for x. Then find the measure of ∠1.



$4x-3 = 2x+13$ by the alt. int ∠'s thm.

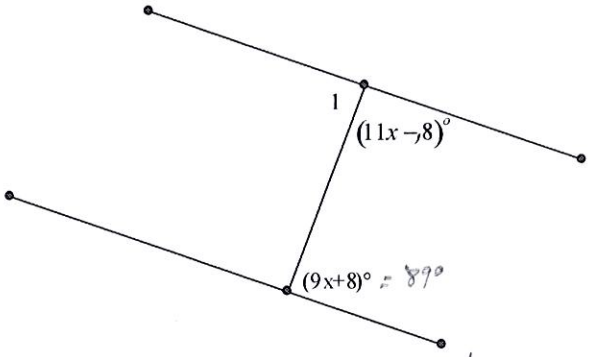
$2x = 16$

$x = 8$

$2(8)+13 = 29$

$m\angle 1 = 180-29 = 151°$

6. Solve for x. Then determine whether ∠1 is a right angle.



$9x+8+11x-8 = 180$ by the consecutive int ∠'s thm

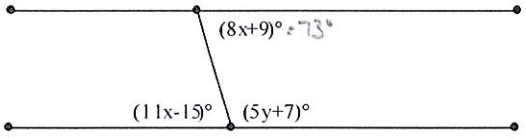
$20x = 180$

$x = 9$

$9(9)+8 = 89° = m\angle 1$ by the alt. int ∠'s thm

∠1 is NOT a right angle

7. Solve for *x*. Then, plug back in to find the measure of the angle to help you solve for *y*.



$8x+9 = 11x-15$ by the alt int ∠'s thm

$24 = 3x$

$8 = x$

$8(8)+9 = 73°$

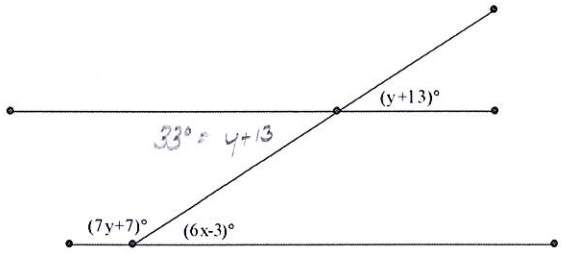
$5y+7+73 = 180$ by the consec. int ∠'s thm

$5y+80 = 180$

$5y = 100$

$y = 20$

8. Solve for *y*. Then, plug back in to find the measure of the angle to help you solve for *x*.



$y+13+7y+7 = 180$ by the consec int ∠'s postulate

$8y+20 = 180$

$8y = 160$

$y = 20$

$20+13 = 33$ by the alt int. ∠'s thm.

$33 = 6x-3$

$36 = 6x$

$6 = x$