

Parallel Angle Relationships with Algebra

Directions: In each of the following, identify the relationship between the two given angles. Then, write an appropriate equation in order to solve for x and find the measurement of the given angle.

1)

$$11x = 10x + 9$$

$$\begin{array}{r} -10x \\ \hline x = 9 \end{array}$$

Relationship: Alt. Int (Congruent)

x = 9

$10x + 9 = 10(9) + 9 = \boxed{99^\circ}$

2)

$$3x + 32 = 5x - 10$$

$$\begin{array}{r} -3x \\ \hline 32 = 2x - 10 \\ +10 \\ \hline 42 = 2x \\ \frac{42}{2} = \frac{2x}{2} \\ \boxed{21 = x} \end{array}$$

Relationship: Alt. Ext. (Congruent)

x = 21

$5x - 10 = 5(21) - 10 = \boxed{95^\circ}$

3)

$$6x + 8 = 7x - 5$$

$$\begin{array}{r} -6x \\ \hline 8 = x - 5 \\ +5 \\ \hline \boxed{13 = x} \end{array}$$

Relationship: Corresponding

x = 13

$7x - 5 = 7(13) - 5 = \boxed{86^\circ}$

4)

$$20x + 5 + 24x - 1 = 180$$

$$44x + 4 = 180$$

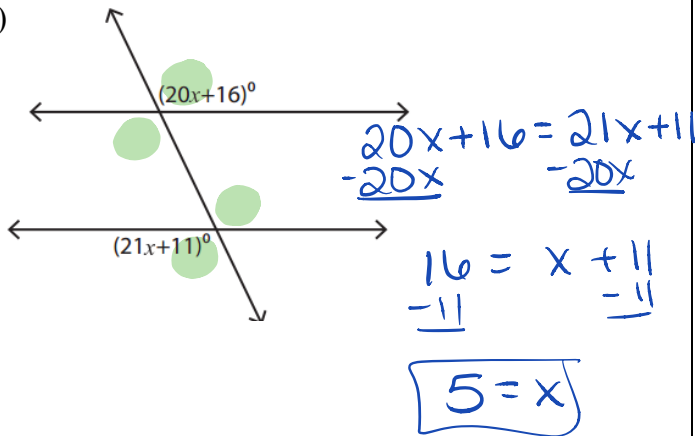
$$\begin{array}{r} -4 \\ \hline 44x = 176 \\ \frac{44x}{44} = \frac{176}{44} \\ \boxed{x = 4} \end{array}$$

Relationship: Supplementary

x = 4

$\angle AGE = 20(4) + 5 = \boxed{85^\circ}$

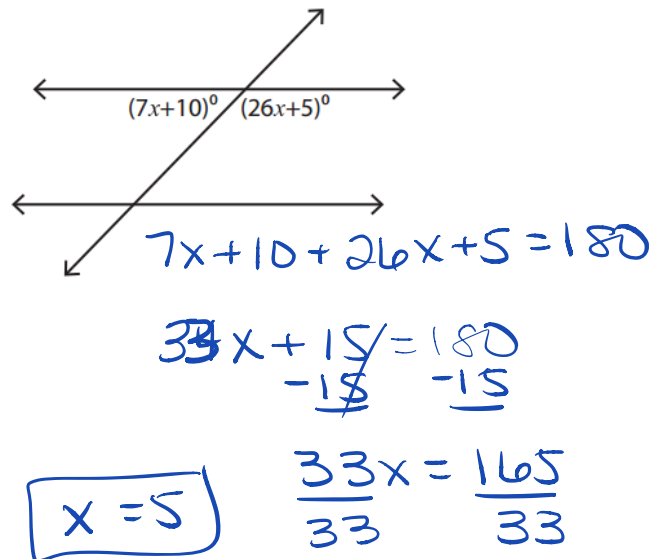
5)

Relationship: Alt. Ext. (Congruent)

x = 5

$21x + 11 = 21(5) + 11 = \boxed{116^\circ}$

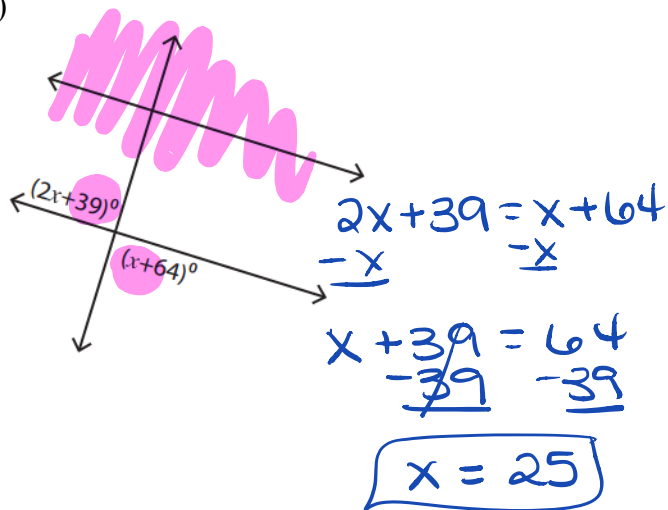
6)

Relationship: Supplementary

x = 5

$26x + 5 = 26(5) + 5 = \boxed{135^\circ}$

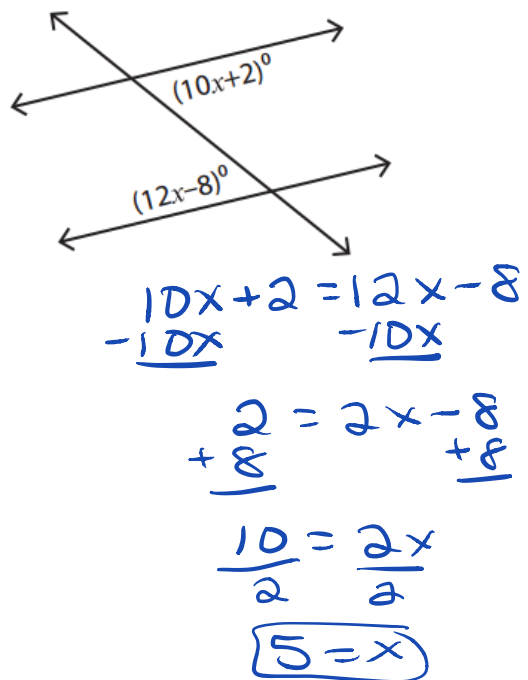
7)

Relationship: Vertical (Congruent)

x = 25

$2x + 39 = 2(25) + 39 = \boxed{89^\circ}$

8)

Relationship: Alt Int

x = 5

$12x - 8 = 12(5) - 8 = \boxed{52^\circ}$

