

## 2.8 Vertical Angles

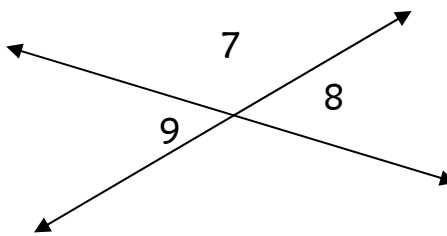
1) Given:  $m\angle 9 = (2x^2 + 2x - 10)^\circ$   
 $m\angle 8 = (x^2 + 4x + 5)^\circ$

Find:  $m\angle 9$

$$2x^2 + 2x - 10 = x^2 + 4x + 5$$

$$x^2 - 2x - 15 = 0$$

$$(x - 5)(x + 3) = 0$$



$$x = 5, -3$$

$$50^\circ, 2^\circ$$

Use the diagram to the right for #2 and #3:

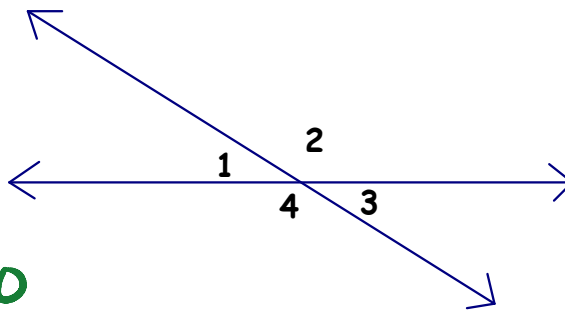
2) Given:  $m\angle 4 = (7x + 44)^\circ$   
 $m\angle 3 = (3x + 36)^\circ$

Find:  $m\angle 1$

$$7x + 44 + 3x + 36 = 180$$

$$10x = 100$$

$$x = 10$$



$$m\angle 1 = m\angle 3 = 66^\circ$$

3) Given  $m\angle 1 = (3x^2)^\circ$   
 $m\angle 3 = (14x + 5)^\circ$

Find:  $m\angle 1$

$$x = -\frac{1}{3}, 5$$

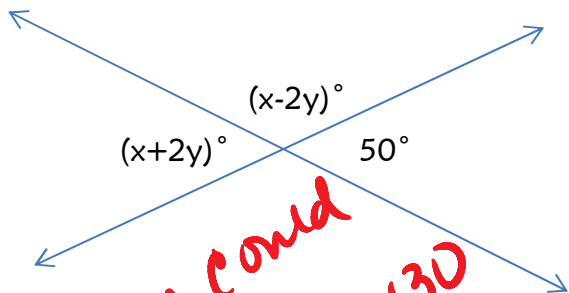
$$m\angle 1 = \left(\frac{1}{3}\right)^\circ, 75^\circ$$

$$3x^2 = 14x + 5$$

$$3x^2 - 14x - 5 = 0$$

$$(3x + 1)(x - 5) = 0$$

4) By how much does  $x$  exceed  $y$ ?



or you could  
say  $x - 2y = 130$

$$x - 2y + x + 2y = 180$$

$$x + 2y = 50$$

$$2x = 180$$

$$x = 90$$

$$y = -20$$

110