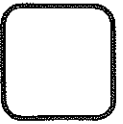
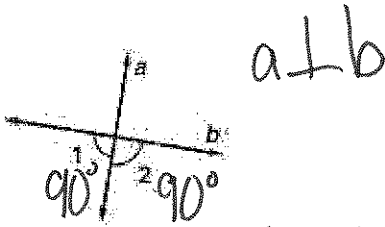


**Learning Goal(s):** I am able to prove theorems about perpendicular lines.  
 I am able to find the distance between a point and a line or two lines.



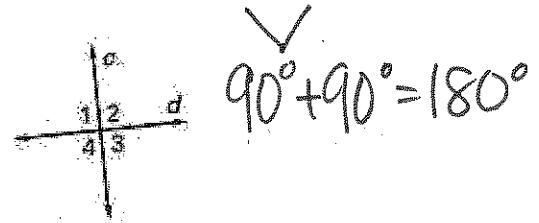
**Notes: 3.6 Prove Theorems About Perpendicular Lines**

**Ex. 1** In the diagram,  $\angle 1 \cong \angle 2$ .  
 What can we conclude about  $a$  and  $b$ ?



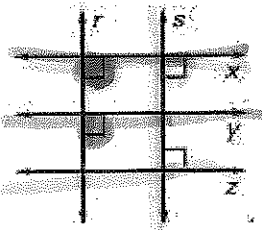
$a \perp b$   
 If lin. pair  $\cong \angle s$ ,  
 then  $\perp$

**Ex. 2** If  $c \perp d$ , what do you know about the sum of the measures of  $\angle 3$  and  $\angle 4$ ?



$90^\circ + 90^\circ = 180^\circ$   
 If  $\perp$ , then 4 rt.  $\angle s$

**Ex. 3** Determine which lines, if any, must be parallel in the diagram. Explain your reasoning.

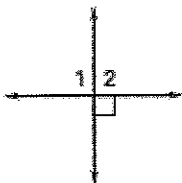


$x \parallel y$  because  $r \perp x, r \perp y$   
 $s \parallel r$ , b/c  $r \perp x, s \perp x$   
 $x \parallel z$ , b/c  $x \perp s, z \perp s$   
 $y \parallel z$  b/c transitive  
 $x \parallel y, x \parallel z$

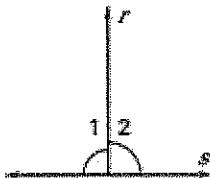
**Practice!**

1. What is the theorem that justifies the statement?

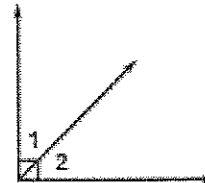
1.  $\angle 1$  and  $\angle 2$  are right angles.



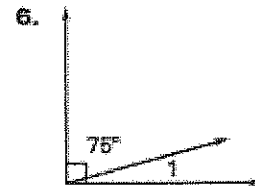
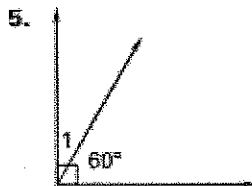
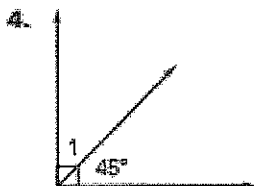
2.  $r \perp s$



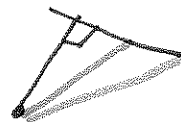
3.  $\angle 1$  and  $\angle 2$  are complementary.



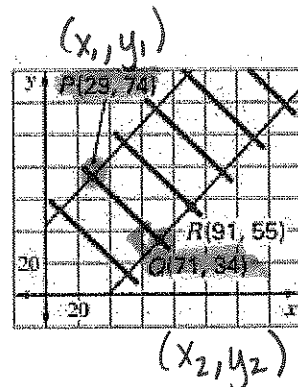
2. Find  $m\angle 1$ .



distance from a point to a line: distance of the perpendicular segment from the point to the line



Ex. 4 What is the approximate distance from line m to line n?



$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(71 - 23)^2 + (34 - 74)^2}$$

$$\sqrt{(48)^2 + (-40)^2}$$

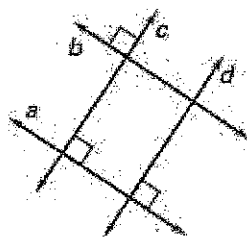
$$\sqrt{2304 + 1600}$$

$$\sqrt{3904} = 58 \text{ units}$$

Try it! For 1 and 2, use the diagram at the right.

1. Is  $c \parallel d$ ? Explain.

2. Is  $b \perp d$ ? Explain



Summary: Write what you learned today, and what you think you still need practice/help