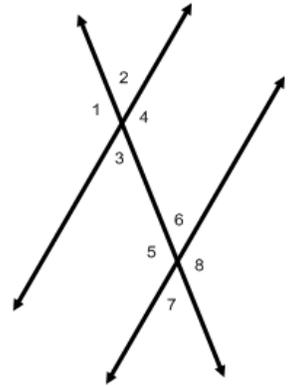


## 3.3 Proving Lines Parallel

Postulate: Converse of the Corresponding Angles PostulateThm: Converse of the Alternate Interior Angles TheoremThm: Converse of the Same-Side Interior Angles TheoremThm: Converse of the Alternate Exterior Angles Theorem

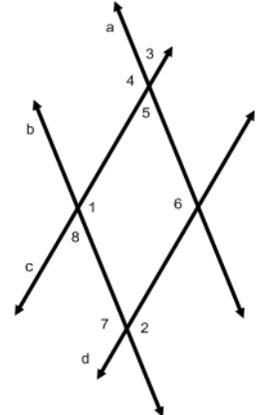
Which lines are parallel if.....Why?

$\angle 1 \cong \angle 2$

$\angle 2 \cong \angle 6$

$\angle 1 + \angle 5 = 180^\circ$

$\angle 8 \cong \angle 3$

Flow proof:**Given:**  $\angle 4 \cong \angle 6$ **Prove:**  $l \parallel m$

Find the degree of the missing angle that would make lines  $u$  and  $v$  parallel.

Find the value of  $x$  that makes lines  $u$  and  $v$  parallel.



Application:

Your try:

Summary:

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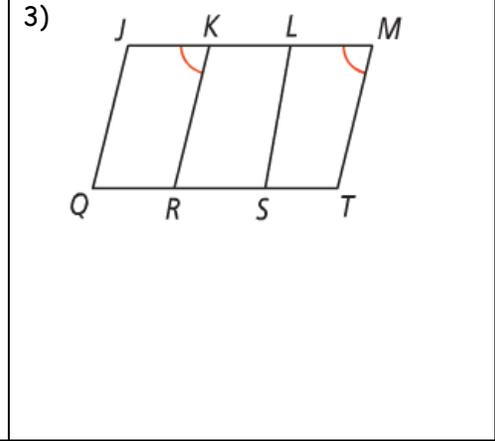
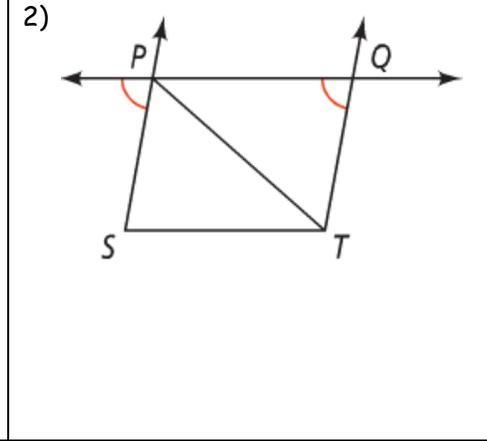
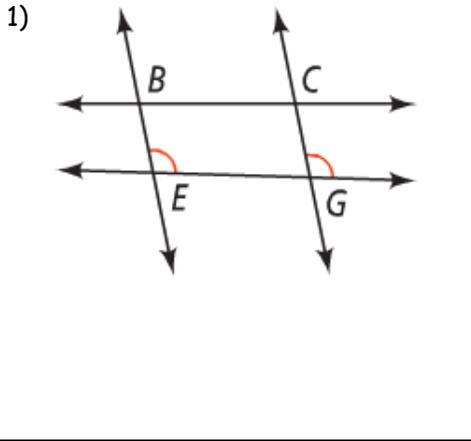
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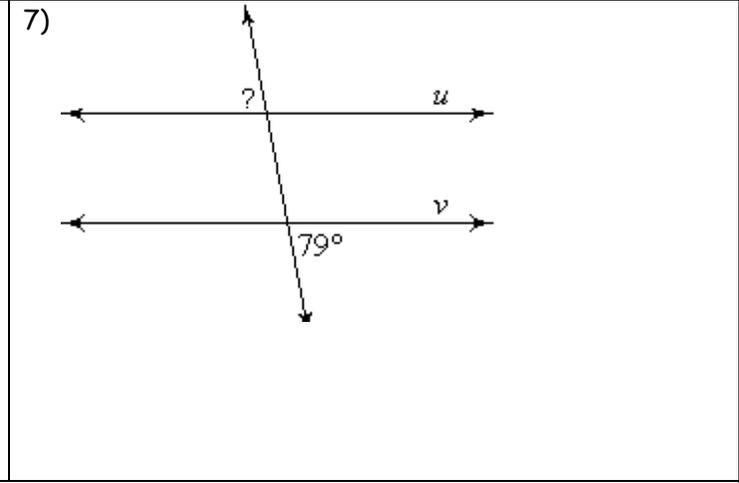
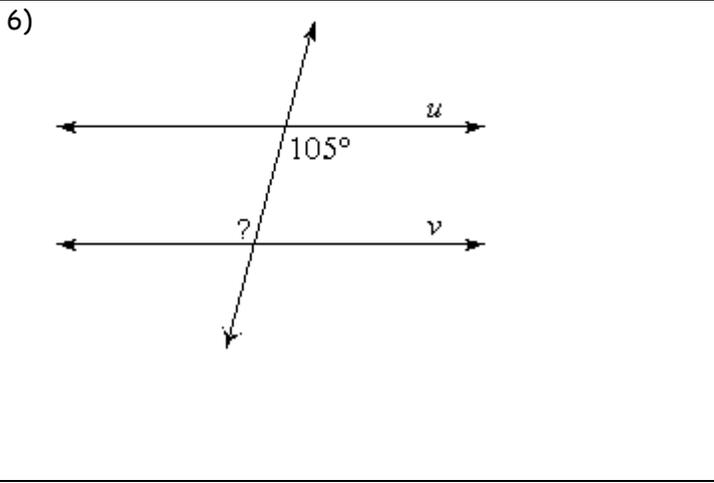
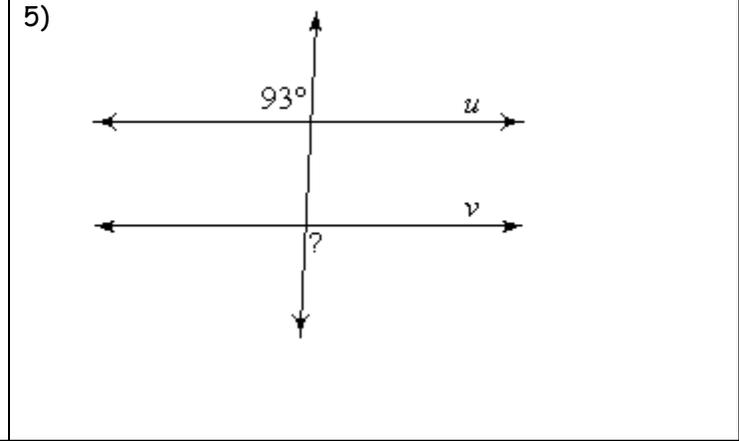
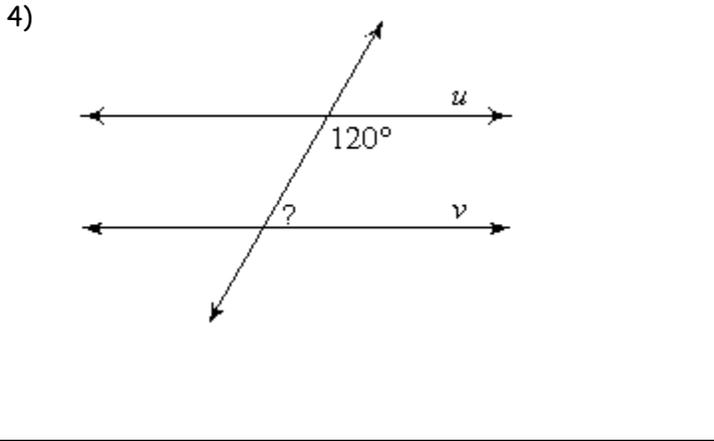
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### 3.3 Practice Problems

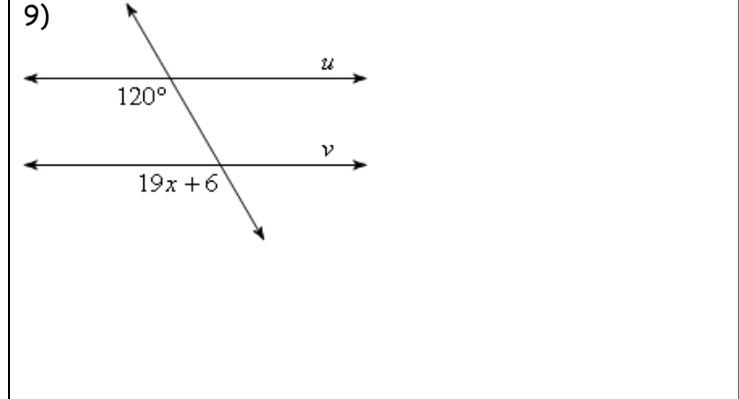
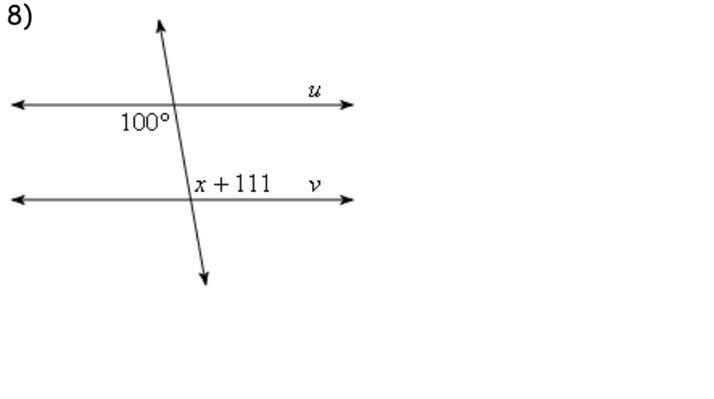
Directions 1-3: Which segments/lines are parallel. JUSTIFY your answer.

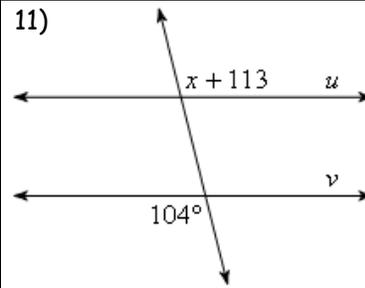
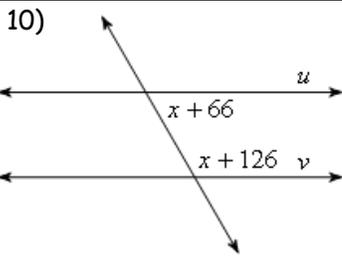


Directions: Find the measure of the indicated angle that makes lines  $u$  and  $v$  parallel.



Directions: Find the values of  $x$  that will make lines  $u$  and  $v$  parallel.





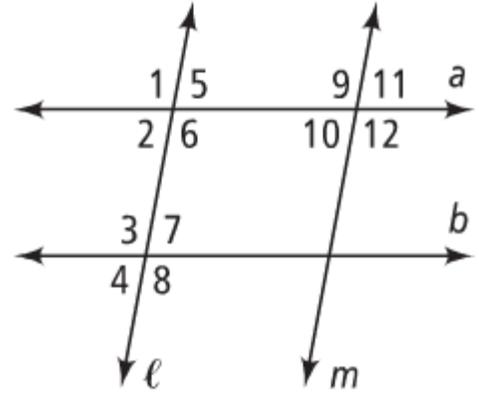
Directions: Use the following diagram to determine which lines (if any are parallel). State the postulate or theorem that justifies your answer.

12)  $\angle 2$  is supplementary to  $\angle 3$

13)  $\angle 9 \cong \angle 12$

14)  $\angle 5 \cong \angle 10$

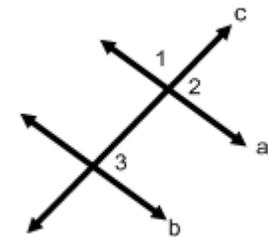
15)  $\angle 7 \cong \angle 11$



Complete the following flow proof.

**Given:**  $\angle 1$  and  $\angle 3$  are supplementary

**Prove:**  $a \parallel b$



$\angle 1$  and  $\angle 3$  are supplementary  
a. \_\_\_\_\_

d. \_\_\_\_\_  
Supplements of the same angle are congruent

b. \_\_\_\_\_  
Def. of a linear pair.

$\angle 1$  and  $\angle 2$  are supplementary  
c. \_\_\_\_\_

$a \parallel b$   
e. \_\_\_\_\_

Algebra Review

Solve:  $7 = 4x - 5$

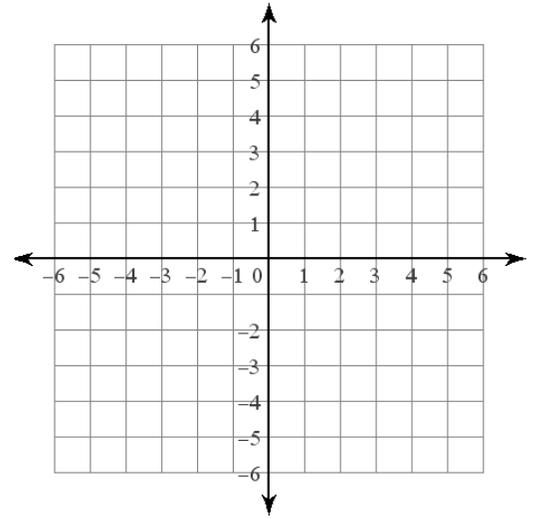
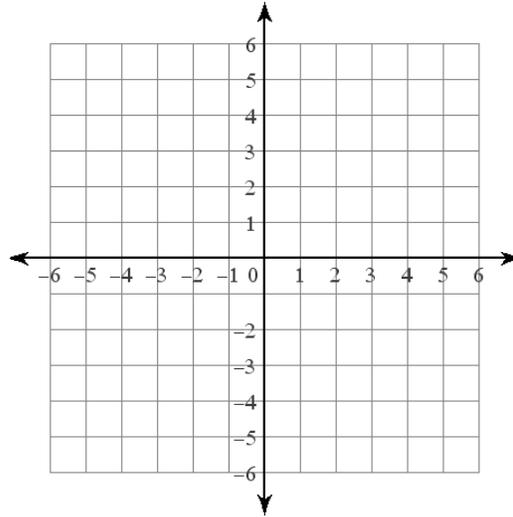
Solve:  $10x - 16 = 2x + 8$

Multiply:  $5x^2(2x^2 - 7)$

Factor:  $16x^{10} - 24x^9$

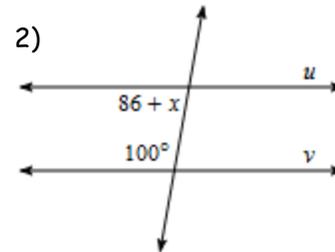
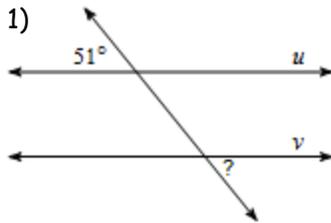
Graph:  $y = -\frac{3}{4}x + 6$

Graph:  $x = -3$



### 3.3 APPLICATION and EXTENSION

Directions: Find the value that makes the lines parallel.



## RICH TASK!

### G-C Placing a Fire Hydrant

Alignments to Content Standards: G-CO.D G-C.A.3

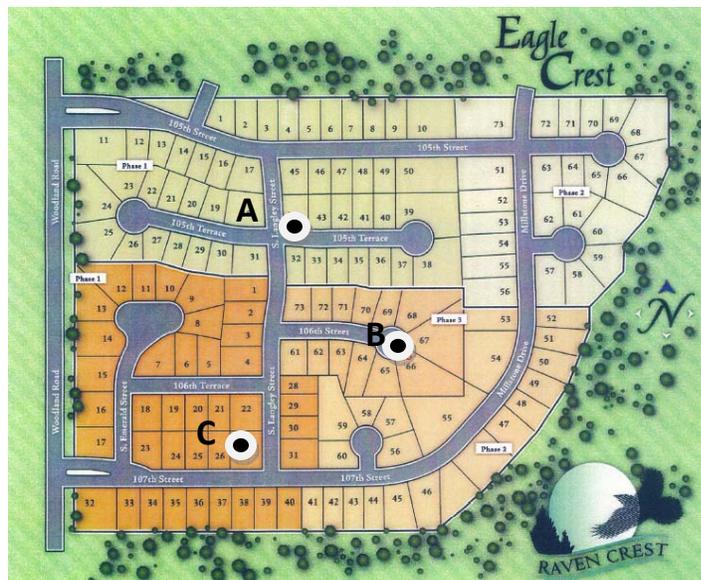
#### Task

You have been asked to place a fire hydrant so that it is an equal distance from three locations indicated on the following map.

While doing this problem, please show all mathematical thinking on this paper. Use complete sentences to explain your thoughts.

Your demonstration of how you attempt the problem and your clearly written justification is just as important as finding your answer.

The task continues on the next page.



*A* •

•  
*B*

•  
*C*

- Show how to fold your paper to physically construct this point as an intersection of **two** creases. It may be helpful to try folding with other paper first. Then on this paper indicate your fold lines with dotted lines.
- Explain why the above construction works, and in particular why you only needed to make two creases.