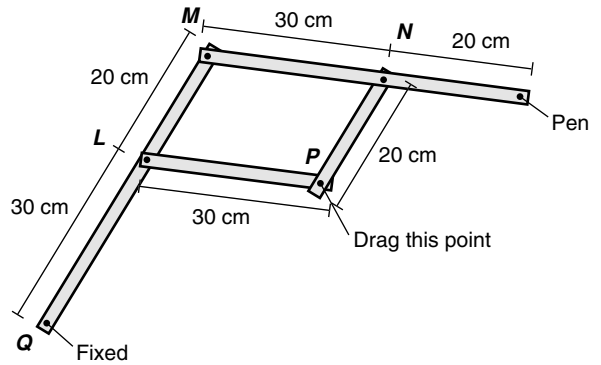


**LESSON** **6-3** **Problem Solving**  
**Conditions for Parallelograms**

Use the diagram for Exercises 1 and 2.  
 A *pantograph* is a drawing instrument used to magnify figures.



1. If you drag the point at  $P$  so that the angle measures change, will  $LMNP$  continue to be a parallelogram? Explain.

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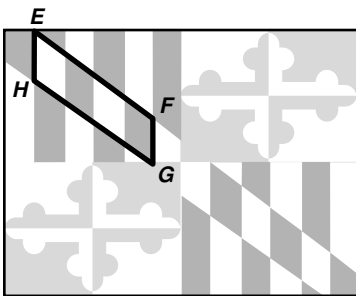


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2. If you drag the point at  $P$  so that  $m\angle LMN = 56^\circ$ , what will be the measure of  $\angle QLP$ ?

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3. In the state flag of Maryland,  $m\angle G = 60^\circ$  and  $m\angle H = 120^\circ$ . Name one more condition that would allow you to conclude that  $EFGH$  is a parallelogram.




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4. The graphs of  $y = 2x$ ,  $y = 2x - 5$ , and  $y = -x$  in the coordinate plane contain three sides of a quadrilateral. Give an equation of a line whose graph contains a segment that can complete the quadrilateral to form a parallelogram. Explain.

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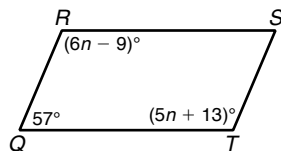
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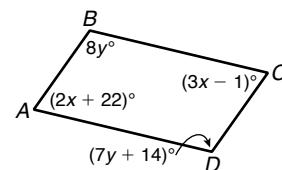
**Choose the best answer.**

5. For which value of  $n$  is  $QRST$  a parallelogram?



- A 15.5  
 B 20.6  
 C 22  
 D 25

6. Under what conditions must  $ABCD$  be a parallelogram?



- F  $x = 23$   
 G  $y = 14$   
 H  $x = 23$  and  $y = 14$   
 J  $x = 14$  and  $y = 23$