

## 12-6 • Guided Problem Solving

### **GPS** Student Page 703, Exercise 24

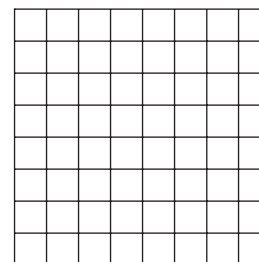
**Coordinate Geometry** Write an equation for the locus: In the plane, the points equidistant from the points  $P(1, 3)$  and  $Q(5, 1)$ .

#### **Read and Understand**

1. What kind of geometric object will the locus of points be? \_\_\_\_\_

#### **Plan and Solve**

2. Plot the points  $P$  and  $Q$  on the grid to the right.
3. Draw  $\overline{PQ}$ . How are the slope of  $\overline{PQ}$  and the slope of the locus related? \_\_\_\_\_
4. Use the given coordinates to find the slope  $M$  of  $\overline{PQ}$ .  $M =$  \_\_\_\_\_
5. Therefore, what is the slope  $m$  of the locus?  $m =$  \_\_\_\_\_
6. What is one point on the locus? That is, what is one obvious point equidistant from  $P$  and  $Q$ ? \_\_\_\_\_
7. What are the coordinates of this point? \_\_\_\_\_
8. Use the coordinates and the value of  $m$  to find the  $y$ -intercept  $b$  of the locus.  $b =$  \_\_\_\_\_
9. Write the equation of the locus in the form  $y = mx + b$ . \_\_\_\_\_



#### **Look Back and Check**

10. Locate the  $x$ -intercept of the locus given in Step 8. \_\_\_\_\_  
Is it equidistant from the two points given in the problem statement? \_\_\_\_\_

#### **Solve Another Problem**

11. Reverse the coordinates— $P(3, 1)$  and  $Q(1, 5)$ . Write the equation of the locus of points equidistant from the points  $P$  and  $Q$ .

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