Open the TI-Nspire document *Points_Lines_and_Distance.tns.*

How do you find the distance between a point and a line? In this activity, you will investigate the distance between two points, a point and a line, and two lines.
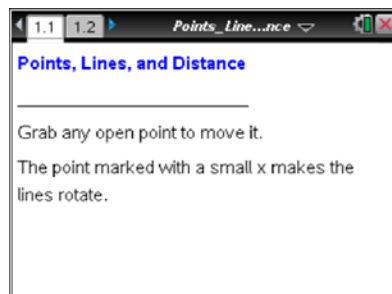
◀ 1.1 1.2 ▶	*Points_Line...nce* ▽
Points, Lines, and Distance	
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Grab any open point to move it.	
The point marked with a small x makes the lines rotate.	

Move to page 1.2.

Press ctrl ▶ and ctrl ◀ to navigate through the lesson.

1. Grab and move point *Q*. What do you notice about the length of $\overline{PQ}$ as it moves?

2. What is the same and what is different about $\overline{PQ}$ and $\overline{RS}$?

3. a. Grab and move point *Q* until point *P* coincides with point *R*. Record the measures of $\overline{PQ}$ and $\overline{RS}$.

    b. Grab and move point *S*. Will $\overline{RS}$ ever be shorter than $\overline{PQ}$? Why or why not?

4. Grab and move point *S* until it coincides with point *Q*. What is the measure of ∡*TSR*? How do you know?

5. What does $\overline{PQ}$ represent?

The distance from a point to a line is the length of the segment from the point perpendicular to the line.

6. Explain why $\overline{RS}$ is not always the distance from point *R* to line *m*.

7. a. What has to be true for $\overline{PQ}$ to be the distance from point Q to line n?

    b. Grab and move the X on line m until $\overline{PQ}$ is the distance from point Q to line n. What is true about lines m and n when $\overline{PQ}$ is the distance from point Q to line n? How do you know?

8. Determine if the statements below are always (A), sometimes (S), or never (N) true. Provide an explanation for your answers. Move lines m and n and points Q and S, as necessary.

Statement	A, S, N	Explanation
The distance between lines m and n is constant.		
RS is the distance from point R to line m.		
When $m \parallel n$, $\overline{PQ}$ is longer than $\overline{RS}$.		
If $m \parallel n$, the distance between lines m and n will be constant.		
If m is not parallel to n, $\overline{PQ}$ is the distance between lines m and n.		
In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.		