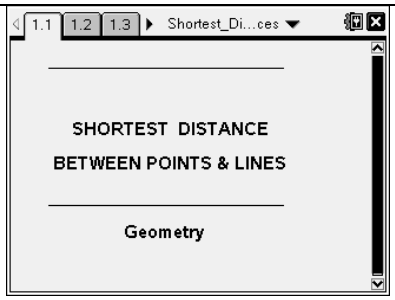
TI-nspire™

Shortest Distances ID: 10213	Name _____ Class _____

In this activity, you will explore three situations involving distances between points and lines.

- *Shortest distance between two points.*
- *Shortest distance from a point to a line.*
- *Smallest total distance from two points on one side of a line and a point on the line.*

Use this document to record your answers.



Problem 1 – Shortest Distance Between Two Points

Open the file *Shortest Distances.* On page 1.3, measure the distances AB, AC and BC.

Find the sum AC + BC and compare its value to the distance AB.

1. Record three sets of distances in the chart:

AB	AC + BC

2. Complete the conjecture:

   The distance AB is _____ the sum of the distances AC + BC

3. Where does C need to be located for the three segments to form a triangle?

4. When there is no triangle formed, what is true about the lengths AB, AC, and BC?

Problem 2 – Shortest Distance From a Point to a Line

On page 2.2, measure the distance from point C to point D.

5. Drag point C along line AB to determine when CD is the smallest.

CD = _____

6. What else is true about the figure when CD is the smallest?

7. Complete the conjecture:

The distance CD is the smallest when _____

Problem 3 – Smallest Total Distance From Two Points to a Line

On page 3.2, measure distances DC and EC and find their sum.

8. Drag point C so the sum DC + EC is as small as it can be.

DC + EC = _____

9. Make some measurements of the figure to help determine what is true when DC + EC is as small as possible. Explain your thinking.

10. Reflect point D over line $\overleftrightarrow{AB}$. What does this new point have to do with the location of point C and the minimum sum?