This exercise will investigate the slopes of parallel and perpendicular lines. The investigation will be done first on paper and then verified on Geometers Sketch Pad as a whole group.

**Investigation I: Parallel Lines**

1. Each graph below contains pairs of lines. Calculate the slope of each line, and record the results in the table on the next page.

   a. [Graph of Line 1 and Line 2]
   
   b. [Graph of Line 1 and Line 2]

   c. [Graph of Line 1 and Line 2]
   
   d. [Graph of Line 1 and Line 2]
2. What pattern do you notice about the slopes?

_________________________________________________________________________
_________________________________________________________________________

3. Do all of the slopes fit the pattern?

_________________________________________________________________________
Why not?
_________________________________________________________________________

4. Write a conjecture about the relationship between the slopes of parallel lines.

_________________________________________________________________________
_________________________________________________________________________
Whole Group
5. Using Geometer's Sketchpad to verify your conjecture. Create four different pairs of parallel lines. Then measure the slopes. Record the results below.

<table>
<thead>
<tr>
<th>Slope 1</th>
<th>Slope 2</th>
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6. Does this confirm your conjecture? __________

Explain. ____________________________________________
_____________________________________________________
_____________________________________________________
Investigation II: Perpendicular Lines

1. Each graph below contains pairs of lines. Calculate the slope of each line, and record the results in the table on the next page.

   a. 
   ![Graph a](image)

   b. 
   ![Graph b](image)

   c. 
   ![Graph c](image)

   d. 
   ![Graph d](image)

   e. 
   ![Graph e](image)

   f. 
   ![Graph f](image)
<table>
<thead>
<tr>
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</table>

2. What pattern do you notice about the slopes?
   __________________________________________
   __________________________________________

3. Do all of the slopes fit the pattern? __________________________
   Why not? __________________________________________

4. Write a conjecture about the relationship between the slopes of perpendicular lines.
   __________________________________________
   __________________________________________

5. How do the slopes of the lines in the third pair of lines fit your conjecture? ________
   __________________________________________

6. How do the slopes of the lines in the fourth pair of lines fit your conjecture?
   __________________________________________
7. As a whole group use Geometer's Sketchpad to verify your conjecture. Create four different pairs of perpendicular lines. Use the slope tool to find the slope of each line.

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<thead>
<tr>
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<th>Slope 1</th>
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<tbody>
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<td>a</td>
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<td>b</td>
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<tr>
<td>c</td>
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<td>d</td>
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</table>

8. Does this confirm your conjecture? __________

Explain. __________________________________________________________

______________________________________________________________

______________________________________________________________