



**Problem 1 – Slopes of lines**

Open a new *Cabri Jr.* file for each part (A, B, and C).

- A.** Construct a line and a point not on the line. Construct a second line through the point that is parallel to the first line. Find the slopes of both lines.

If two lines are parallel, then the slopes of the lines are \_\_\_\_\_

*Converse:* \_\_\_\_\_

*Inverse:* \_\_\_\_\_

*Contrapositive:* \_\_\_\_\_

Determine whether the above conditional statements are true or false. If you decide a statement is false, sketch a counterexample.

- B.** Construct a line and a point not on the line. Construct a second line through the point that is perpendicular to the first line. Find the slopes of both lines.

If two lines are perpendicular, then the slopes of the lines are \_\_\_\_\_

*Converse:* \_\_\_\_\_

*Inverse:* \_\_\_\_\_

*Contrapositive:* \_\_\_\_\_

Determine whether the above conditional statements are true or false. If you decide a statement is false, sketch a counterexample.

- C.** Construct two lines that have the same  $y$ -intercept.

If two different lines have the same  $y$ -intercept, then the lines have different slopes.

*Converse:* \_\_\_\_\_

*Inverse:* \_\_\_\_\_

*Contrapositive:* \_\_\_\_\_

Determine whether the above conditional statements are true or false. If you decide a statement is false, sketch a counterexample.



**Problem 2 – Collinear and noncollinear segments**

**A.** Use the *Cabri Jr.* file **COLSEG** to complete the following.

Find the distances **AB**, **BC**, and **AC**. Drag the points to create different lengths.

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

When do the lengths **AB** and **BC** add up to equal **AC**? \_\_\_\_\_

Write a conditional statement to express your conclusion:

If \_\_\_\_\_, then \_\_\_\_\_

**B.** Use the *Cabri Jr.* file **NOCOLSEG** to complete the following.

Now explore what happens if **AB**, **BC**, and **AC** are not collinear.

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

**AB** \_\_\_\_\_ **BC** \_\_\_\_\_ **AC** \_\_\_\_\_ **AB + BC** \_\_\_\_\_

What is the relationship between **AB + BC** and **AC**? \_\_\_\_\_

Write a conditional statement to express your conclusion:

If \_\_\_\_\_, then \_\_\_\_\_