GEOMETRY Date _____

5.4 Indirect Proof

G.T.4 Indirect Proof

Indirect Proof _____

Step One: Identify the conclusion you are asked to prove. Make the assumption that this conclusion is false by assuming that the opposite is true.

Example 1: **State the assumption necessary to start an indirect proof of each statement.**

a. $m\angle ABC < m\angle CBA$

b. $\triangle DEF \cong \triangle RST$

c. Line a is perpendicular to line b.

d. $\angle 5$ is supplementary to $\angle 6$.

Step Two: Use logical reasoning to show that this assumption leads to a contradiction of the hypothesis, or some other fact, such as a definition, postulate or corollary.

Step Three: Point out that since the assumption leads to a contradiction, the original conclusion, what you were asked to prove, must be true.

Example 2: **Write an indirect proof to show that if $-2x + 11 < 7$ *then* $x > 2$**

Assumption:

Contradiction:

Therefore:

Example 3: **Given :** $x + 2$ ***is an even integer***.

Prove : x is an even integer

Assumption:

Contradiction:

Therefore:

Example 4: **Given :** xy ***is an odd integer***

Prove : x and y are both odd integers

Assumption:

Contradiction:

Therefore:

Example 5: **Given :** ***A triangle can have only one right angle***

Assumption:

Contradiction:

Therefore: