

Geometry (H)
Conditional Statements

Name: KEY

Decide if the following statements are true or false. If the statement is false, provide a counterexample.

1. If 3 points lie on the same line, then they are collinear.

T Converse: If three points are collinear, then they lie on the same line.

T Inverse: If three points do not lie on the same line, then they are not collinear.

T Contrapositive: If three points are not collinear, then they do not lie on the same line.

2. If three points don't lie on one line, then they determine a unique plane.

T Converse: If three points determine a unique plane, then they don't lie on one line.

T Inverse: If three points lie on one line, then they do not determine a unique plane.

T Contrapositive: If three points do not determine a unique plane, then they lie on one line.

Write the converse, inverse and contrapositive for each conditional statement. Determine if each conditional is true or false.

3. If two segments have the same length, then they are congruent.


T Converse: If two segments are congruent, then they have the same length.

T Inverse: If two segments do NOT have the same length, then they are NOT \cong .

T Contrapositive: If two segments are not \cong , then they do NOT have the same length.

4. If a triangle is equilateral, then it is isosceles. T

F Converse: If Δ is isosceles, it is equilateral. ☾

F Inverse:  If a Δ is not equilateral, it is not isosceles.
Could have 2 sides \cong \rightarrow an isosceles.

T Contrapositive: If a Δ is not isosceles, then it is not equilateral.

5. If $\angle A$ is acute, then $m\angle A \neq 100$. T

F Converse: If $m\angle A \neq 100$, then $\angle A$ is acute.

F Inverse: If $\angle A$ is not acute, then $m\angle A = 100$. ☾

T Contrapositive: If $m\angle A = 100$, then $\angle A$ is not acute.

6. If $x^2 > 1$, then $x > 1$. F

T Converse: If $x > 1$, then $x^2 > 1$.

T Inverse: If $x^2 \neq 1$, then $x \neq 1$.

F Contrapositive: Could be $x^2 = 1 \rightarrow x = \pm 1$; could be $x^2 < 1$, then $-1 < x < 1$

If $x \neq 1$, then $x^2 \neq 1$. ☾

counterexamples $\left\{ \begin{array}{l} x=1, \rightarrow x^2=1 \\ x < 1, \rightarrow (-3)^2 > 1 \end{array} \right.$