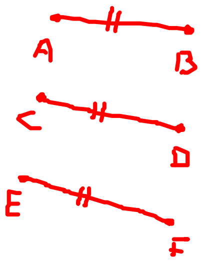
Inductive Reasoning and Conjectures

Conjecture - An educated guess based on observations.

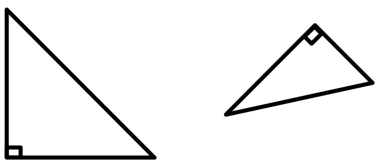
Given: $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$

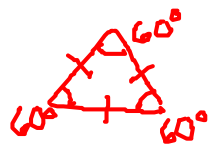


Conjecture: $\overline{AB} \cong \overline{EF}$

Counterexample - An example that shows that a conjecture is false.

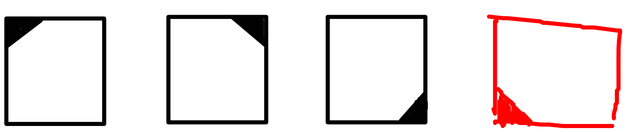
All triangles are right. False





Counterexample

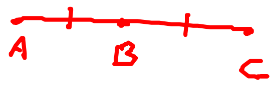
Inductive Reasoning - The process of looking for patterns and making conjectures.

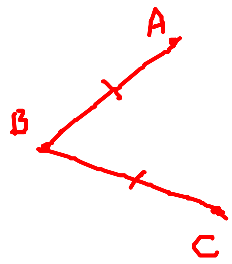


Directions: Determine if the conjecture is true or false based on the given information.

1. Given: $AB = BC$.

   Conjecture: A, B and C are collinear.



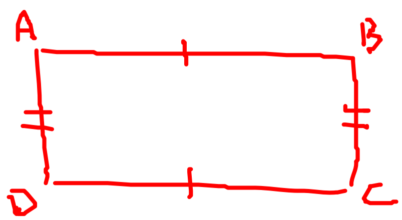


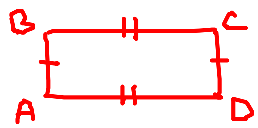
False

Counterexample

2. Given: $ABCD$ is a rectangle.

   Conjecture: $AB = CD$ and $AD = BC$.





True

3. Given: $\measuredangle 1$ and $\measuredangle 2$ are complementary.

   Conjecture: $\measuredangle 1 \cong \measuredangle 2$.

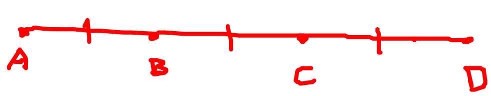
$m\measuredangle 1 = 45^\circ$ $m\measuredangle 2 = 45^\circ$

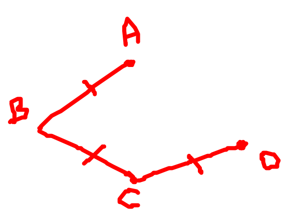
$m\measuredangle 1 = 40^\circ$ $m\measuredangle 2 = 50^\circ$ Counterexample

False

4. Given: $\overline{AB} \cong \overline{BC} \cong \overline{CD}$.

   Conjecture: A, B, C and D are collinear.





Counterexample

False

5. Given: x is a prime number.
   Conjecture: x is odd.

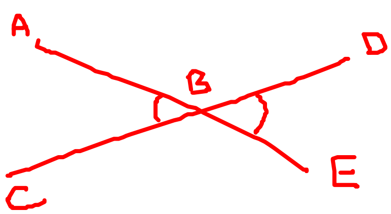
3, 5, 7, 11

counterexample 2

$\boxed{\text{False}}$

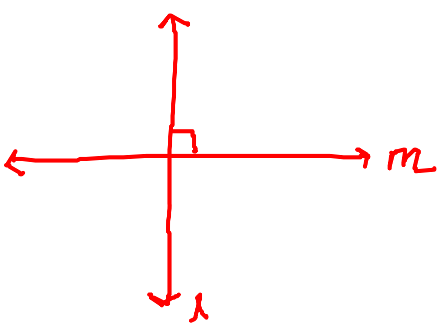
Directions: Write a conjecture based on the given information.

6. $\measuredangle ABC$ and $\measuredangle DBE$ are vertical angles.



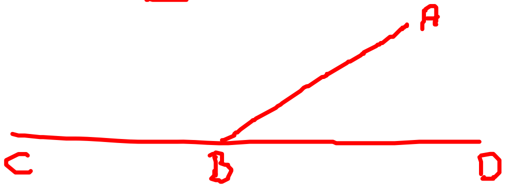
$\boxed{\text{conjecture: } \measuredangle ABC \cong \measuredangle DBE}$

7. ℓ and m intersect to form right angles.



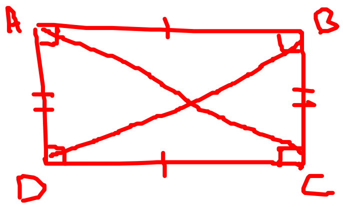
$\boxed{\text{conjecture: } \ell \perp m}$

8. $\measuredangle ABC$ and $\measuredangle ABD$ form a linear pair.



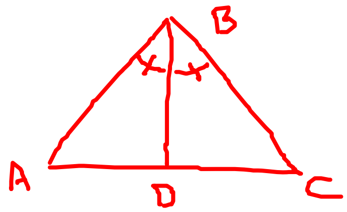
$\boxed{\text{conjecture: } m\measuredangle ABC + m\measuredangle ABD = 180^\circ}$

9. *ABCD* is a rectangle.



conjecture: $\overline{AB} \cong \overline{CD}$ and $\overline{AD} \cong \overline{BC}$

10. In $\triangle ABC$, $\measuredangle ABC$ is the angle bisector.



conjecture: $\measuredangle ABD \cong \measuredangle CBD$

11. The product of $(n-1)$ and $(n+1)$.

$(N-1)(N+1) = N^2 + \cancel{N} - \cancel{N} - 1 = \boxed{N^2 - 1}$

$N = 1$ $(1-1)(1+1) = (0)(2) = \underline{0}$ $1^2 = 1$ $1^2 - 1$

$N = 2$ $(2-1)(2+1) = (1)(3) = \underline{3}$. $2^2 = 4$ $2^2 - 1$

$N = 3$ $(3-1)(3+1) = (2)(4) = \underline{8}$. $3^2 = 9$ $3^2 - 1$

$N = 4$ $(4-1)(4+1) = (3)(5) = \underline{15}$. $4^2 = 16$ $4^2 - 1$

$N = 5$ $(5-1)(5+1) = (4)(6) = \underline{24}$. $5^2 = 25$ $5^2 - 1$

is the square of the # minus 1