Geometry

Review 2.1 - 2.4

~

You need your notebook and whiteboard stuff
**biconditional statement:**
a biconditional statement is a way to write TWO conditional statements using only one statement.

**a biconditional will (usually) have the phrase "if and only if" between the hypothesis and conclusion**

Ex. An angle is acute if and only if its measure is less than $90^\circ$.

This biconditional statement says...

*If an angle is acute, then its measure is less than $90^\circ$. *

AND

*If the measure of an angle is less than $90^\circ$, then it is acute.*

A true biconditional statement is one in which both statements are true.
Example: Make a conjecture about the next item in the sequence.

(1) 2, -6, 18, -54, ... 162

(2) 1, 1, 2, 3, 5, 8, 13, ...

1 + 1 = 2
1 + 2 = 3
2 + 3 = 5
8 + 13 = 21
Example: Make a conjecture based on the given information. Draw a figure to illustrate your conjecture.

\[ \overline{AB} \text{ bisects } \overline{CD} \text{ at } K. \]
**Example:** For the given statement, determine whether the following conjecture is true or false. Give a counterexample if it is false.

**Given:** \( \angle 1 \) and \( \angle 2 \) are supplementary angles.

**Conjecture:** \( \angle 1 \) and \( \angle 2 \) form a linear pair.
Example: Draw a Venn diagram to represent the following conditional statement.

All dogs drink water.

If you are a dog, then you drink water.
Example: Write the following conditional statements in if-then form.

1) Math teachers love to solve problems.
   IF YOU ARE A MATH TEACHER,
   THEN YOU LOVE TO SOLVE PROBLEMS.

2) Vertical angles are congruent.
   IF YOU HAVE VERTICAL ANGLES,
   THEN THEY ARE CONGRUENT.
Example: Write the converse, inverse, and contrapositive of the following conditional statement, then state the truth value of each.

All triangles are polygons.

Converse:

If a figure is a triangle, then it is a polygon. \( \text{T} \)

Inverse:

If a figure is a polygon, then it is a triangle. \( \text{F} \)

Contrapositive:

If a figure is not a polygon, then it is not a triangle. \( \text{T} \)
Example: Determine whether a valid conclusion can be made from the following statements. If so, write the conclusion. Otherwise, write no conclusion.

1) If you interview for a job, then you wear a suit.
2) If you interview for a job, then you will get a job offer.

No conclusion

1) If an angle measures $< 90^\circ$, then it is acute.
2) If an angle is acute, then it is not obtuse.
Example: Determine if statement (3) follows from statements (1) and (2). If it does, write *valid conclusion*. If not, write *no valid conclusion*.

(1) If it snows outside, you will wear your winter coat.
(2) It is snowing outside.
(3) You will wear your winter coat.

(1) Two complimentary angles are both acute angles.
(2) \( \angle 1 \) and \( \angle 2 \) are acute angles.
(3) \( \angle 1 \) and \( \angle 2 \) are complimentary.