2.2 Analyze Conditional Statements

**Conditional Statements**
Logical statement with two parts
- ________________
- ________________
- Often written in If-Then form
- If part contains ______________________
- Then part contains ______________________

If we confess our sins, then He is faithful and just to forgive us our sins. 1 John 1:9

___ __________

**If-then Statements**  $p \rightarrow q$
The if part implies that the then part ________________.
The then part ________________ imply that the first part happened.

Focus: If you are hungry, then you should eat.
John is hungry, so... ________________
Megan should eat, so... ________________

**Converse**  $q \rightarrow p$

If we confess our sins, then he is faithful and just to forgive us our sins.
$p =$ ________________
$q =$ ________________
Converse = If ________________, then ________________.
Does not necessarily make a true statement (It doesn’t even make any sense.)

**Negation**  $\neg p$

The board is white.

**Inverse**  $\neg p \rightarrow \neg q$

If we confess our sins, then he is faithful and just to forgive us our sins.
______ = we confess our sins
______ = he is faithful and just to forgive us our sins
Inverse = If ________________, then ________________.
Not necessarily true (He could forgive anyway)
Contrapositive: \(~q \rightarrow \sim p\)

If we confess our sins, then he is faithful and just to forgive us our sins.

\(p = \text{we confess our sins}\)  \(q = \text{he is faithful and just to forgive us our sins}\)

Contrapositive = If \(~p\), then \(~q\).

Always true.

Write the following in If-Then form and then write the converse, inverse, and contrapositive.

All whales are mammals.

Biconditional Statement

Logical statement where the \(\text{_________________________}\) and \(\text{_________________________}\) are both true.

Written with “if and only if” \(\text{_________________________}\).

An angle is a right angle if and only if it measure 90°.

Perpendicular Lines

Lines that intersect to \(\text{m} \perp \text{r}\).

Write this definition as an if-then statement.

Write this definition as a biconditional statement.

Use the diagram shown. Decide whether each statement is true. Explain your answer using the definitions you have learned.

1. \(\triangle MFN \text{ and } \triangle MGJ\) are supplementary

2. Point M is the midpoint of \(FH\)

3. \(\triangle MFN \text{ and } \triangle HGM\) are vertical angles.

4. \(FH \perp HG\)

Assignment: 82 #4-20 even, 26, 28, 32, 36-52 even, 53-55 all = 24 total