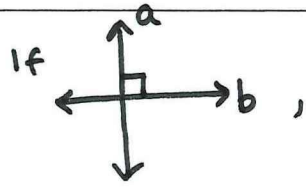
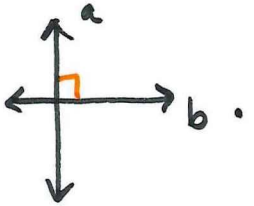
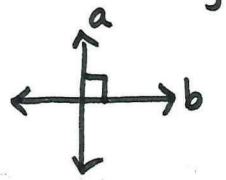
Section 2.2 Date

Analyze Conditional Statements

Vocabulary	Definition	Symbol	Example
CONDITIONAL STATEMENT	A logical statement that has two parts, a hypothesis and a conclusion.		All dogs are mammals.
IF-THEN FORM	A form of a conditional statements in which the "if" part ~~follows~~ contains the hypothesis and the "then" part contains the conclusion.	$P \rightarrow Q$ $\rightarrow$ = then	P If an animal is a dog, then it is a mammal. Q "If P, then Q." True Valid
HYPOTHESIS	A hypothesis is the "if "part of a conditional statement.	P	P = an animal is a dog
CONCLUSION	A conclusion is the "then" part of a conditional statement.	Q	Q = it is a mammal.

NEGATION	The negation of a statement is the opposite of the original statement.	$\sim$ not	I like blue. P I do not like blue. $\sim P$
CONVERSE	The converse of a conditional statement is formed by switching the hypothesis and the conclusion.	$Q \rightarrow P$	If an animal is a dog, then it's a mammal. (P, Q) If an animal is a mammal, then it is a dog. (Q, P) False invalid
INVERSE	The inverse of a conditional statement is formed by negating both the hypothesis and conclusion. negate the conditional ($P \rightarrow Q$)	$\sim P \rightarrow \sim Q$	If an animal is not a dog, then it is not a mammal. ($\sim P$, $\sim Q$) "If not P, then not Q." False invalid
CONTRAPOSITIVE	The contrapositive of a conditional statement is formed by negating ~~both the hypothesis and the conclusion.~~ the converse. ($Q \rightarrow P$)	$\sim Q \rightarrow \sim P$	If an animal is not a mammal, then it is not a dog. ($\sim Q$, $\sim P$) True valid

EQUIVALENT STATEMENTS	Equivalent statements are two statements that are both true or both false.		
PERPENDICULAR LINES	If two lines ~~that~~ intersect to form a right angle, then they are perpendicular lines. If two lines are perpendicular lines, then they intersect to form right angles.	$\perp$ Perpendicular	If  , then line a $\perp$ line b. If line a $\perp$ line b, then  .
BICONDITIONAL STATEMENT	A statement that contains the phrase "if and only if." Both the conditional ($P \rightarrow Q$) and the converse ($Q \rightarrow P$) must be true (equivalent statements) to write a biconditional ($P \leftrightarrow Q$) or $Q \leftrightarrow P$	$P \leftrightarrow Q$	P Two lines intersect to form right angles, if and only if they are perpendicular lines.  $\leftrightarrow$ line a $\perp$ line b. Q "P if and only if Q."

conditional statement if - then form	$P \rightarrow Q$
converse	$Q \rightarrow P$
inverse	$\sim P \rightarrow \sim Q$
contrapositive	$\sim Q \rightarrow \sim P$
Biconditional	$P \leftrightarrow Q$