CODE RED – DO NOW
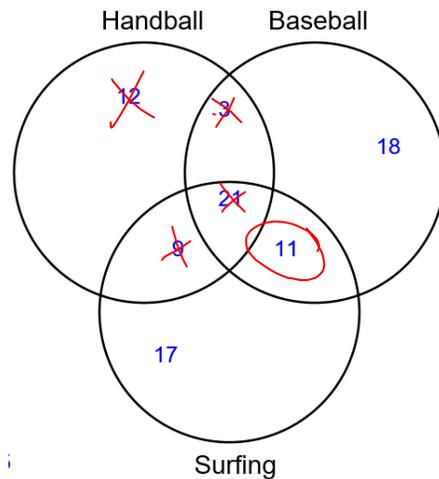
Complete Problems #1-4

1. How many students like Handball and Baseball? $3 + 21 = 24$

2. How many students do not like Surfing? $12 + 3 + 18 = 33$

3. How many students like S V H? 73

4. How many students like _only_ Baseball and Surfing? 11

Handball   Baseball

12   3
18
21
8   11
17

Surfing

SEMESTER EXAM BOOT CAMP: G.1 REVIEW

SOL G.1

By the end of class today, I will be able to identify the converse, inverse, and contrapositive of a conditional statement and translate short verbal arguments into symbolic form by accurately answering 8 out of 10 problems (80% accuracy).

Essential Questions: What is a conditional statement? What are its converse, inverse and contrapositive? How do I represent these symbolically and graphically?

TODAY'S AGENDA

✓DO NOW

✓G.1 Conditional Statements Review
  ✓Converse, Inverse, and Contrapositive
  ✓Symbolic Form
  ✓Deductive Reasoning
  ✓Venn Diagram practice

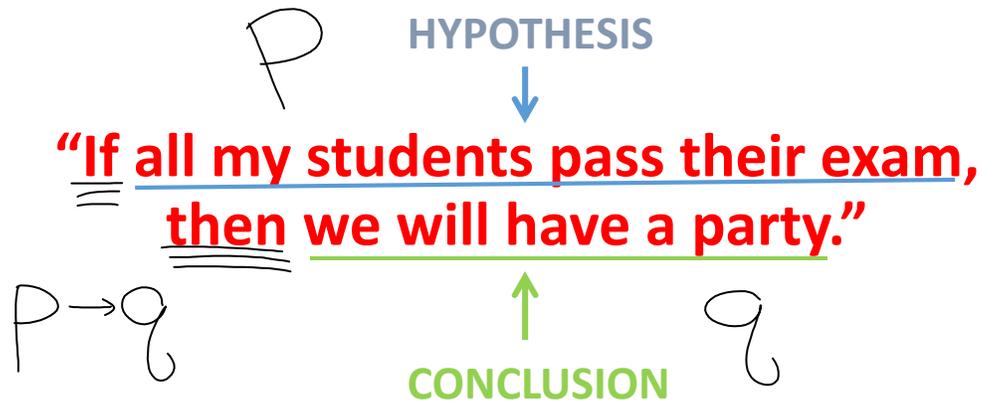✓Exit Ticket

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CODE YELLOW

In your notes, write an example of a
CONDITIONAL STATEMENT.
Hint: If...,then...

"If all my students pass their exam, then we will have a party."

CODE YELLOW

Two parts of a conditional statement

HYPOTHESIS

↓

P

"**If all my students pass their exam, then we will have a party.**"

$P \rightarrow q$

q

↑

CONCLUSION

Label the two parts of your conditional statement

CODE YELLOW

Three ways to modify a conditional statement:

Conditional:
If p, then q.
$p \rightarrow q$

Converse: Change order
If q, then p.
$q \rightarrow p$

Inverse: Insert "Not"
If not p, then not q.
$\sim p \rightarrow \sim q$

Contrapositive: Change order and insert "Not"
If not q, then not p.
$\sim q \rightarrow \sim p$

CODE YELLOW

Conditional: p → q

"**If all my students pass their exam, then we will have a party.**"

Converse: Change Order
"If we have a party, then all my students passed their exam."

Inverse: Insert "Not"
"If all my students do not pass their exam, then we will not have a party."

Contrapositive: Change Order & Insert Not
"If we do not have a party, then all my students did not pass their exam."

CODE GREEN

Write the converse, inverse and contrapositive of your conditional statement.

CODE YELLOW

Which is the <u>converse</u> of the sentence, "If Sam leaves, then <u>I will stay.</u>"?

$q \rightarrow p$

A If <u>I stay</u>, then <u>Sam</u> will leave.
B If Sam does not leave, then I will not stay
C If Sam leaves then I will not stay.
D If I do not stay, then Sam will not leave

Which statement is the <u>inverse</u> of "If the waves are small, <u>I do not go surfing</u>"?

$\sim p \rightarrow \sim q$

A If the waves are not small, I do not go surfing.
B If I do not go surfing, the waves are small.
C If I go surfing, the waves are not small.
D If the waves are not small, I go surfing.

CODE YELLOW

Vocabulary:

The **Truth Value** of a conditional statement is either TRUE or FALSE

A **Counterexample** proves a conditional false

Conditional:
If you have a dog, then you are a pet owner.
Converse:
If you are a pet owner, then you have a dog.
Counterexample: Cats, Fish, Lizard, etc.

CODE GREEN

Determine the Truth Values of each of your conditional statements.

CODE YELLOW

Translating Arguments:

Let p = *You play basketball.*
Let q = *You play a sport.*

Argument: *If you do not play basketball, then you play a sport.*

$$\sim p \longrightarrow q$$

CODE YELLOW

Translating Arguments:

Let *p* = *Wear a coat.*
Let *q* = *You will not be cold.*

Argument: *If you do not wear a coat, then you will be cold.*

$$\sim p \rightarrow \sim q$$

CODE YELLOW

Translating Arguments:

p = you are a good student

q = you get good grades

Write:

CODE GREEN

Translating Arguments:

Let p represent
        Brent works this summer.

Let q represent
        Brent takes a vacation.

Symbolically represent the following argument.

① *If Brent works this summer, then he will not take a vacation.*

$p \rightarrow \sim q$

② *Brent takes a vacation.*

q

③ *Therefore, Brent does not work this summer.*

$\therefore \sim p$

CODE YELLOW

Drawing Conclusions:

The Law of Detachment:

If the **hypothesis** of <u>true</u> conditional is true, then the **conclusion** is true.

Symbols

If	$p \rightarrow q$	is true
and	p	is true,
then	$\therefore \quad q$	is true.

CODE YELLOW

Drawing Conclusions:

Example:

P

$P \rightarrow q$ **If a student gets an A on the final exam,**

Then the student will pass the course.

P

Dwayne gets a 93% on the final exam.

$\therefore q$ **Therefore, Dwayne will pass the course.**

CODE YELLOW

Drawing Conclusions:

Example:

P

$P \rightarrow q$ **If a student takes Geometry,**

then that student passed Algebra 1.

q

Jon passed Algebra 1.

NC   **No Conclusion. Jon could be in another**

class. (ex: Algebra II, Calculus, etc.)

CODE YELLOW

Drawing Conclusions:

The Law of Syllogism allows you to state a conclusion from con other.

Example

If it is July, then you are on summer vacation.

If you are on summer vacation, then you work at a smoothie shop.

You conclude: If it is July, then you work at a smoothie shop.

Symbols

If $p \rightarrow q$ is true

and $q \rightarrow r$ is true,

then $p \rightarrow r$ is true.

$p \rightarrow q$

$q \rightarrow r$

$\therefore p \rightarrow r$

CODE YELLOW

Drawing Conclusions:

Example:

$p \rightarrow q$ If it is raining, then I will take the bus.

$q \rightarrow r$ If I take the bus, then I will be late.

$\therefore p \rightarrow r$ If it is raining, then I will be late.