Bellwork 9/16/15

Find the next two terms in the pattern.

1, 2, 6, 24, 120,...

1, 4, 9, 16, 25,...

36, 49

P 85

③ parallelogram, rectangle, etc.

⑧ -3, 4, -4 (positive, negative digits)

⑫ N, T (one, two, three,...)

⑬ Star

⑭ Will be odd

⑯ Count example:

⑰

⑱ $\frac{1}{2} \cdot 2 = 1$

⑲ $20, 201, 202,
\quad x^3 + 1$
Chapter 2: Reasoning and Proof

2-2: Conditional Statements

Using Symbolic Reasoning

Conditional statement - an if-then statement with a hypothesis and a conclusion

\[ p : \text{hypothesis} \quad \text{and} \quad q : \text{conclusion} \]

If \( p \), then \( q \).

Example:

If a race is 800 meters, then the race is two laps around a track.

\[ p \quad \text{and} \quad q \]

If \( p \), then \( q \) or \( p \rightarrow q \)

“\( p \) implies \( q \)”
Using Symbolic Reasoning

Converse - exchange the hypothesis and conclusion

\[ \text{if } q \text{, then } p \]

\[ q \rightarrow p \]

If a race is two laps around a track, then the race is 800 meters.

If \( q \), then \( p \). or \( q \rightarrow p \)

Sep 12-12:22 PM

Truth value - every time the hypothesis is true, the conclusion is also true.

A conditional statement is either true or false!

Counterexample - hypothesis is true, and conclusion is false, then conditional statement is false.

\[ \neg \text{true, false, counterexample} \]
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<tr>
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If m∠A = 15, then ∠A is acute
If ∠A is acute, then m∠A = 15
If m∠A ≠ 15, then ∠A is not acute
If ∠A is not acute, then m∠A ≠ 15

You are a freshman if and only if you are in 9th grade.
### Equivalent statements: same truth value

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<td>If (\angle A) is acute, then m(\angle A = 15)</td>
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<td>Inverse:</td>
<td>If (\neg p), then (\neg q)</td>
<td>If m(\angle A \neq 15), then (\angle A) is not acute</td>
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<td>If (\angle A) is not acute, then m(\angle A \neq 15)</td>
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p: The figure is a square

q: The figure is a quadrilateral

**Conditional:** *If the figure is a square, then the figure is a quadrilateral.*

**Converse:** *If the figure is a quadrilateral, then the figure is a square.* CE:

**Inverse:** *If the figure is not a square, then the figure is not a quadrilateral.*

**Contrapositive:** *If the figure is not a quadrilateral, then the figure is not a square.*
Rewrite as a conditional statement:

1. Thanksgiving in the US falls on the fourth Thursday of November.

2. Two intersecting lines meet in exactly one point.

3. Two congruent figures have equal areas.

4. Through any two points is exactly one line

Simultaneous round table

Law of Detachment

Applying a true conditional statement to make a conclusion.  \[ \text{general} \rightarrow \text{specific} \]

Given: If two angles are vertical, then they are congruent

Angles 3 and 4 are vertical.

Conclusion: \[ \text{Angles 3 \& 4 are } \cong \]

Law of Syllogism

If \( p \rightarrow q \) and \( q \rightarrow r \) are true conditional statements, then \( p \rightarrow r \) is true

\[ p \rightarrow q \rightarrow r \]

If the football crosses the goal line, then you score a touchdown.

If you score a touchdown, then you get 6 points.

Conclusion:

If the football crosses the goal line, then you get 6 points. \[ p \rightarrow r \]
Homework: p. 93 # 2, 4, 6, 28, 36, 42, 51, 52