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Geometry worksheet 2.4 conditional statements answers

Geometry conditionals worksheet. Geometry 2.1-2.3 conditionals worksheet answer key. Geometry 2.1-2.3 conditionals worksheet.

Written by January 11, 2023 Fact-checked by Paul Mazzola Geometry is a wonderful part of mathematics for people who don't like a lot of numbers. It has shapes and angles, and it also has logic. Logic is formal, correct thinking, reasoning, and inference. Logic is not something humans are born with; we have to learn it, and geometry is a great way to learn to be logical. Converse statements You may know the word converse for a verb meaning to chat, or for a noun as a particular brand of footwear. Neither of those is how mathematicians use converse. Converse and inverse are connected concepts in making conditional statements. To create the converse of a conditional statement, switch the hypothesis and conclusion. To create the inverse of a conditional statement, turn both hypothesis and conclusion to the negative. Converse and Inverse of a Conditional Statement Converse statement examples If I eat a pint of ice cream, then I will gain weight. (Conditional Statement) If I gained weight, then I ate a pint of ice cream. (Converse) If I do not eat a pint of ice cream, then I will not gain weight. (Inverse) Converse Statement Examples Conditional statements Conditional statements set up conditions that could be true or false. These conditions lead to a result that may or may not be true. Conditional statements start with a hypothesis and end with a conclusion. Conditional statement examples If my cat is hungry, then she will rub my leg. If a polygon has exactly four sides, then it is a quadrilateral. If triangles are congruent, then they have equal corresponding angles. Conditional Statement Examples You can always test the hypothesis. Does the polygon have four sides? Are the triangles congruent? If the hypothesis is false, the conclusion is false. Here are examples of conditional statements with false hypotheses: If I am 9 meters tall, then I can play basketball. If a square has three sides, then its interior angles add to 180° . You can test the hypothesis immediately: Are you 9 meters tall?

LESSON
2.1 NAME _____ DATE _____
Practice A
For use with pages 71-78

Identify the hypothesis and the conclusion.

- If the weather is warm, then we should go swimming.
- If you want good service, then take your car to Joe's Service Center.
- If you like purple, you'll love this sweater.
- $2x - 12 = 40$ only if $x = 26$.
- If the groundhog sees its shadow, then there will be six more weeks of winter.

Rewrite the conditional statement in if-then form.

- Today is Monday if yesterday was Sunday.
- An object measures 12 inches if it is one foot long.
- A number is divisible by 4 if it is divisible by 8.
- An acute angle is an angle that measures less than 90° .
- All students taking geometry are in tenth grade.

Decide whether the statement is true or false. If false, provide a counterexample.

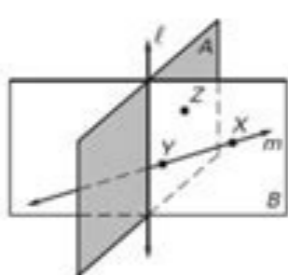
- The equation $2x - 7 = 5 + x$ has exactly one solution.
- If $x^2 = 16$, then x must equal 8 or -8 .
- February 14 is Valentine's Day.
- If you visited the Statue of Liberty, then you've been to New York.
- A point may lie on at most two lines.

Write the converse and contrapositive of each statement.

- If you like tennis, then you play on the tennis team.
- If x is odd, then $2x$ is even.
- If $m\angle P = 45^\circ$, then $\angle P$ is acute.

Use the diagram to state the postulate(s) that verifies the truth of the statement.

- The points X , Y , and Z lie in a plane (labeled B).
- The points X and Y lie on a line (labeled m).
- The planes A and B intersect in a line (labeled l).
- The points X and Y lie in a plane B . Therefore, line m lies in plane B .



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Chapter 2 Resource Book

Do squares have three sides? These conditional statements result in false conclusions because they started with false hypotheses. Creating conditional statements Conditional statements begin with "If" to introduce the hypothesis. The hypothesis is the part that sets up the condition leading to a conclusion. The conclusion begins with "then," like this: Creating Conditional Statements (If, Then) If my dog barks, then my dog observed something that excited him. You will see conditional statements in geometry all the time. You can set up your own conditional statements. Here is one for an isosceles triangle: If the triangle is isosceles, then only two of its sides are equal in length. Exchanging parts of conditional statements You can switch the hypothesis and conclusion of a conditional statement. You take the conclusion and make it the beginning, and take the hypothesis and make it the end: If my dog observes something that excites him, then he barks. If triangles have equal corresponding sides, then they are congruent. Converse of a conditional statement The converse of a true conditional statement does not automatically produce another true statement. It might create a true statement, or it could create nonsense: If a polygon is a square, then it is also a quadrilateral. That statement is true. But the converse of that is nonsense: If a polygon is a quadrilateral, then it is also a square. We know it is untrue because plenty of quadrilaterals exist that are not squares. Geometry and conditional statements Many times in geometry we see postulates and theorems that seem like they could become conditional statements and converse conditional statements: Parallel lines never meet. (Postulate) If two lines are parallel, then they are lines that never meet. (Conditional Statement) If two lines never meet, then they are parallel. (Converse) Example #2 Adjacent angles share a common side. (Postulate) If angles share a common side, then they are adjacent. (Conditional Statement) If angles are adjacent, then they share a common side. (Converse) Some postulates are even written as conditional statements: If two parallel lines are cut by a transversal, then the corresponding angles are congruent. If two points lie in a plane, then the line joining them lies in that plane. Practice conditional statements Below we have equilateral triangle $\triangle NAP$. We can set up conditional statements about it. Here are five statements. Decide which ones are conditional, which are not conditional, and which conditional statements are true. Conditional statements geometry If $\triangle NAP$ is equilateral, then its interior angles are all equal. If $\triangle NAP$ is equilateral, then interior $\angle N$ is 60° . If interior $\angle N$ is 60° , then $\triangle NAP$ is equilateral. Equilateral triangles have equal interior angles. If $\triangle NAP$ is equilateral, then it is also isosceles. Statements 1, 2, and 5 are all true conditional statements (If ... then). Statement 3 is a converse of statement 2. Statement 4 is not a conditional statement, but it is true. You have enough information to change statement 4 into a conditional statement. Let's check the converse statement, 3, to see if it is true. Can you create a triangle with one interior angle measuring 60° but with the other angles having different measures? Of course you can, like a 30° - 60° - 90° triangle, which is definitely not equilateral. So the converse statement is not true. Lesson summary In this lesson you have learned to identify and explain conditional statements and create your own conditional statements. You know conditional statements could be true or false.

Geometry Homework Worksheets: Chapter 2

HW #6: Problems #1-11

Show all of your work!

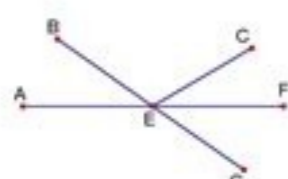
For #1-3, choose the best answer for each multiple choice question.

- Which of the following statements is/are always true?
 - adjacent angles are acute
 - if $m\angle 2 = 70^\circ$, then $\angle 2$ is acute
 - two acute angles make a right angle
 - I only
 - II only
 - III only
 - both I and II
 - I, II, and III
- Identify the converse of the conditional statement below:
If I break my iPod, I will get in trouble.
 - If I don't break my iPod, I won't get in trouble.
 - If I break my iPod, I will get in trouble.
 - If I get in trouble, I will break my iPod.
 - If I don't get in trouble, I didn't break my iPod.
 - none of the above
- Identify a counterexample to the given statement:
If $\angle A$ is obtuse, then $m\angle A = 120^\circ$
 - $\angle A$ is an acute angle
 - $\angle A$ is a right angle
 - $m\angle A = 120$
 - $m\angle A = 80$
 - $m\angle A = 110$

For questions 4-7 translate each of the following into a mathematical expression.

- The difference of four times a number and seven.
- Three times the difference of a number and two.
- The sum of two and the quotient of a number and five.
- The product of four times a number and nine.

For questions 8-11, justify each statement with a definition, postulate, or theorem. Refer to the figure on the right.



- If E is the midpoint of \overline{AF} , $\overline{AE} \cong \overline{EF}$.
- $AE + EF = AF$
- If \overline{BG} bisects \overline{AF} , then E is the midpoint of \overline{AF} .
- $m\angle AEC + m\angle CEF = 180^\circ$.

You are able to exchange the hypothesis and conclusion of a conditional statement to produce a converse of the statement, and you can test to see if the converse of a true conditional statement is true.