

Watch. Practice. Understand. | Lesson 037

Section 2 2 Conjecture and Inductive Reasoning

Watch the matching video: <https://www.youtube.com/watch?v=7vfqdiTU338>

Practice focus: Logic, conjectures and proof

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Write the converse of: If a figure is a square, then it is a rectangle. Is the converse true?

02 Write the contrapositive of: If n is divisible by 4, then n is even.

03 Give a counterexample to: Every prime number is odd.

04 Justify each step when solving $3x + 5 = 20$.

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Practice focus: Segments, angles and geometric basics

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

05 B lies between A and C. $AB = 2x + 1$, $BC = x + 5$, $AC = 24$. Find x and both parts.

06 Supplementary angles measure $3x + 10$ and $2x + 20$ degrees. Find both angles.

07 Vertical angles measure $4x - 5$ and $2x + 25$ degrees. Find x .

08 State the dimensions of a point, a line and a plane.

Worked answers | Lesson 037

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01 Write the converse of: If a figure is a square, then it is a rectangle. Is the converse true?

Converse: If a figure is a rectangle, then it is a square. False: a 2-by-3 rectangle is a counterexample.

02 Write the contrapositive of: If n is divisible by 4, then n is even.

If n is not even, then n is not divisible by 4. It is logically equivalent to the original statement.

03 Give a counterexample to: Every prime number is odd.

2 is prime and even; one counterexample disproves the universal claim.

04 Justify each step when solving $3x + 5 = 20$.

Subtract 5 using the subtraction property of equality: $3x = 15$. Divide by 3 using the division property: $x = 5$.

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05 B lies between A and C. $AB = 2x + 1$, $BC = x + 5$, $AC = 24$. Find x and both parts.

Segment addition: $3x + 6 = 24$, so $x = 6$. $AB = 13$ and $BC = 11$.

06 Supplementary angles measure $3x + 10$ and $2x + 20$ degrees. Find both angles.

$5x + 30 = 180$, so $x = 30$. Angles: 100° and 80° .

07 Vertical angles measure $4x - 5$ and $2x + 25$ degrees. Find x .

Vertical angles are equal: $4x - 5 = 2x + 25$, so $x = 15$; both angles are 55° .

08 State the dimensions of a point, a line and a plane.

A point is 0-dimensional, a line 1-dimensional, and a plane 2-dimensional.