



Proof—a logical argument that shows a statement is true

- Types of proofs:
 - ★ two-column proofs
 - paragraph proofs
 - flow proofs
- Postulate—a rule that is accepted without proof
- Theorem—a statement that can/must be proven true

title

proof

Two-Column Proofs

Statements	Reasons
Start with the <u>given</u> information/statement(s).	The first reason will always be GIVEN.
Statements should be listed in a logical order.	Reasons will be: <ul style="list-style-type: none"> ➤ Definitions ➤ Properties ➤ Postulates ➤ Theorems
Use the given diagram(s) to come up with a new statement if you get stuck.	
The last statement should be the information listed after <u>PROVE</u> .	The last reason will NEVER be PROVE.

Algebraic Properties of Equality

ADDITION PROPERTY:
add the same thing to both sides of an equation

SUBTRACTION PROPERTY:
subtract the same thing from both sides of an equation

MULTIPLICATION PROPERTY:
multiply both sides of an equation by the same thing

DIVISION PROPERTY:
divide both sides of an equation by the same thing

two-column proofs

algebraic properties

Algebraic Properties of Equality

Let a , b , and c , be real numbers.

DISTRIBUTIVE PROPERTY:
 $a(b + c) = a \cdot b + a \cdot c$

SUBSTITUTION PROPERTY:
 If $a = b$, then b can be substituted for a in any equation or expression.

SIMPLIFY:
 combine like terms on one or both sides of an equation

Combine Like Terms

algebraic properties

More Properties of Equality

Let a , b , and c , be real numbers.

REFLEXIVE PROPERTY:
 Real numbers: $a = a$
 Segment length: $AB = AB$
 Angle measure: $m\angle A = m\angle A$

SYMMETRIC PROPERTY:
 Real numbers: If $a = b$, then $b = a$.
 Segment length: If $AB = CD$, then $CD = AB$.
 Angle measure: If $m\angle A = m\angle B$, then $m\angle B = m\angle A$.

$9 = x$ then $x = 9$

more properties

More Properties of Equality

Let a , b , and c , be real numbers.

TRANSITIVE PROPERTY:
 Real numbers: If $a = b$ and $b = c$, then $a = c$.
 Segment length: If $AB = CD$ and $CD = EF$, then $AB = EF$.
 Angle measure: If $m\angle A = m\angle B$ and $m\angle B = m\angle C$, then $m\angle A = m\angle C$.

Like Law of Syllogism

more properties

Solve the equation and write a reason for each step.

Given: $4 + 2(3x + 5) = 77 - x$ Prove: $x = 9$

① $4 + 2(3x + 5) = 77 - x$	① Given
② $4 + 6x + 10 = 77 - x$	② Distributive Prop.
③ $6x + 14 = 77 - x$	③ Simplify/Like Terms
④ $7x + 14 = 77$	④ Addition Prop.
⑤ $7x = 63$	⑤ Subtract Prop.
⑥ $x = 9$	⑥ Division Prop.

examples

Conclusion

1. What types of proofs are there?

2 column, Paragraph, Flow

2. What are the steps in completing a proof?

Given to Prove by Properties

3. Will everyone's be the same??? NO

4. Questions????

Assignment

Proof Wkst

Sep 25-9:20 AM

Sep 25-9:22 AM