

S-6 Geometry Session 5 6/25

IF ^{hypothesis} you are watching the Minions Movie, then you
should punch yourself in your stupid, stupid face.
conclusion

Converse IF you punch yourself in your stupid, stupid
face, then you are watching the Minions Movie.

false: counterexample: you could be Nate.

IF it is ^{hypothesis} August 29th 2024, then all of your
assignments are due today. conclusion

Converse

IF all of your assignments are due today, then
it is August 29th 2024. True!

Biconditional Statement

All of your assignments are due today if, and
only if, it is August 29th 2024.

Law of Syllogism (Transitive Property)

$$A \rightarrow B \quad B \rightarrow C \quad A \rightarrow C$$

① If you played Fortnite for the last 2 weeks,
then you are living a sad life.

If you are living a sad life, then you should
② at least treat yourself to some Krispy Kreme
Donuts.

If you played Fortnite for the last 2 weeks,
then you should at least treat yourself to
some Krispy Kreme Donuts

Law of Detachment

If you owe ^{hypothesis} money to hobos, then you live
in constant fear of hobo attack. ^{conclusion}

- Tyler owes money to hobos. ^{hypothesis} → ^{conclusion}
Tyler lives in constant fear of hobo attack.

- Maxwell lives in constant fear of hobo attack. ^{conclusion} ✗ ^{hypothesis}
No conclusion

Introduction to Proofs

Given: $3x + 12 = 8x - 18$

Prove: $x = 6$

Statements

$$\begin{array}{r} 3x + 12 = 8x - 18 \\ \underline{-12} \quad \underline{-12} \end{array}$$

$$\begin{array}{r} 3x = 8x - 30 \\ -8x \quad -8x \end{array}$$

$$\begin{array}{r} -5x = -30 \\ \underline{-5} \quad \underline{-5} \end{array}$$

$$x = 6$$

Reasons

Given

[Not "sub"]
Subtraction Property
of Equality (both
sides)
(SPE)
"sub PoE"

Subtraction Property
of Equality (SPE)

Division Property
of Equality (DPE)
Div PoE

Given: $3k + 5 = 17$ ←

Prove: $k = 4$

Statement

$$\rightarrow 3k + 5 = 17$$

-5 -5

$$\frac{3k}{3} = \frac{12}{3}$$

$$k = 4$$

Reasons

Given

Sub POE

Div POE

Given: $3(5x - 1) = 13x + 5$

Prove: $x = 4$

Statements

$$3(5x - 1) = 13x + 5$$

$$15x - 3 = 13x + 5$$

+3 +3

$$15x = 13x + 8$$

-13x -13x

$$2x = 8$$

$$x = 4$$

Reasons

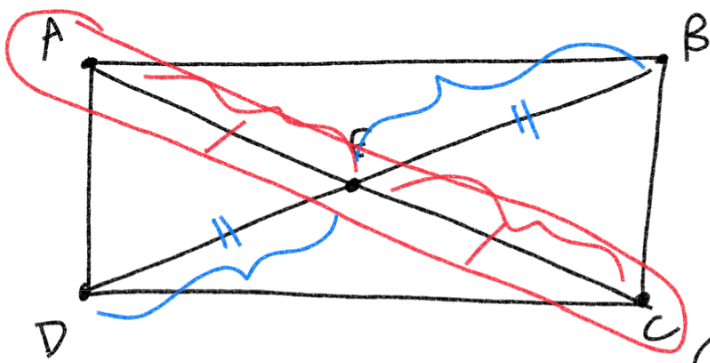
Given

Simplify or Distributive Property

Addition Property of Equality (APE)
or Add POE

Sub POE

Div POE



Given: E is the midpoint of \overline{AC} and \overline{BD}

$$\overline{ED} \cong \overline{EC}$$

Prove: $\overline{AE} \cong \overline{BE}$

Statement

E is the midpoint of \overline{AC} and \overline{BD}

Reasons

Given

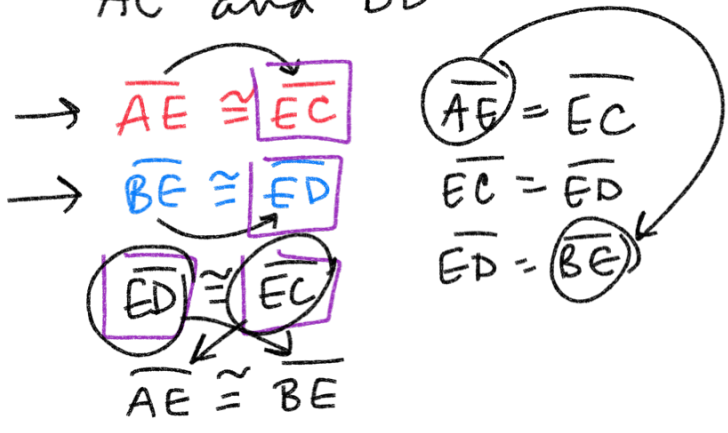
Definition of midpoint

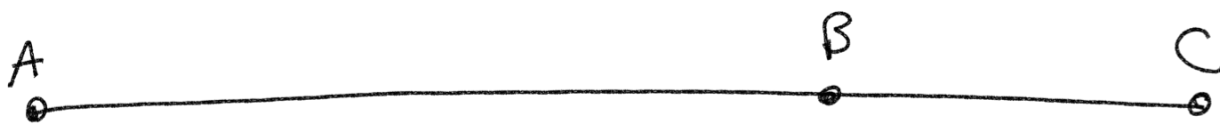
Def of midpoint

Given

Substitution

or
Law of Syllogism





Given: $\overline{AB} = 2x + 3$

$\overline{BC} = x$

$\overline{AC} = 24$

Prove: $x = 7$

Statements

$\overline{AB} = 2x + 3$

$\overline{BC} = x$

$\overline{AC} = 24$

$\overline{AB} + \overline{BC} = \overline{AC}$

↓ ↓ ↓

$2x + 3 + x = 24$

$3x + 3 = 24$
 $\quad -3 \quad -3$

$3x = 21$
 $\quad \frac{3}{3} \quad \frac{3}{3}$

$x = 7$

Reasons

Given

Segment Addition
Postulate (SAP)

Substitution

Simplify ^{"combine like terms"}

Sub POE

Div POE

