M-G Geometry Week 7 10/23

hypothesis

If you are watching a Minions movie, then you want to punch yourself in your stupid, stupid face.

conclusion

Converse: If you want to punch yourself in your stupid, stupid face, then you are watching a Minions movie. False

Counterexample: You could be Nate.

hyp

If today is October 23rd, then your Test 1 is due today. Conc.

Converse: If your Test 1 is due today, then it is October 23rd. true

Biconditional Statement

Your Test 1 is due today if, and only if, it is Oct 23rd.

If you are still playing Fortnite, ~~then you're living a sad, lonely life.~~

~~If you are living a sad, lonely life,~~ then you should probably bring people Duck Donuts so you can have friends.

Law of Syllogism $A \to B$ $B \to C$ $A \to C$

If you are still playing fortnite, then you should probably bring people Duck Donuts so you can have friends.

Law of Detachment

If you owe money to hobos, then you live in constant fear of hobo attack.

Dylan owes money to hobos

Dylan lives in constant fear of hobo attack

Ezekiel lives in constant fear of hobo attack

No conclusion

Introduction to Proofs

$\boxed{\text{Given:}}$ $3x + 12 = 8x - 18$

Prove: $\boxed{x = 6}$

Statements	Reasons
$3x + 12 = 8x - 18$	Given
$-3x \qquad -3x$	Subtraction Property of Equality (SPE)
$12 = 5x - 18$	
$+18 \qquad +18$	Addition Property of Equality (APE)
$\frac{30}{5} = \frac{5x}{5}$	
$\boxed{6 = x}$	Division Property of Equality
$x = 6$	Reflexive Property

Given: $3k + 5 = 17$

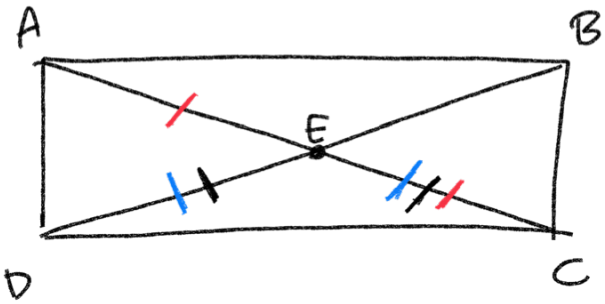
Prove: $k = 4$

Statements	Reasons
$3k + 5 = 17$	Given
$-5 \qquad -5$	Sub POE
$\frac{3k}{3} = \frac{12}{3}$	Div POE
$k = 4$	

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

Prove: $x = 1$

Statements	Reasons
$3(5x+1) = 13x+5$	Given
$15x+3 = 13x+5$ $-3 \qquad -3$	Distributive Property or simplify
$15x = 13x+2$ $-13x \qquad -13x$	Sub PoE
$\frac{2x}{2} = \frac{2}{2}$	Sub PoE
$x = 1$	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		Reasons
$\boxed{\overline{AE} \cong \overline{EC}}$	$A \to B$ $\overline{AE} \cong \overline{EC}$	Definition of midpoint
$\boxed{\overline{BE} \cong \overline{ED}}$	$B \to C$ $\overline{EC} \cong \overline{ED}$	Definition of midpoint
$\boxed{\overline{ED} \cong \overline{EC}}$	$C \to D$ $\overline{ED} \cong \overline{BE}$	Given
$\overline{AE} \cong \overline{BE}$	$A \to D$	$\overline{AE} \cong \cancel{\overline{EC} \cong \overline{ED}} \cong \overline{BE}$ Law of Syllogism / Transitive Property

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

$\overline{BC} = x$

$\overline{AC} = 24$

Prove $x = 7$

Statement	Reasons
$\overline{AB} = 2x+3$	Given
$\overline{BC} = x$	
$\overline{AC} = 24$	
$\overline{AB} + \overline{BC} = \overline{AC}$	Segment Addition Postulate
$\downarrow \quad \downarrow \quad \downarrow$	Substitution
$2x+3 + x = 24$	Sub POE
$-3 \qquad -3$	
$2x + x = 21$	simplify
$\frac{3x}{3} = \frac{21}{3}$	Div POE
$x = 7$	