

BEGINNING PROOFS: ALGEBRAIC PROOFS

Solve each problem as a two-column proof.

Statements	Justifications
1. $-224 = 6(-3 - 7m) + 4$	Given
$-224 = (-18) - 42m + 4$	Distribute
$-224 = -14 - 42m$	CLT
$\begin{array}{r} -224 \\ +14 \\ \hline -210 \end{array} = \begin{array}{r} -42m \\ -42 \\ \hline -42 \end{array}$	Addition Prop.
$5 = m$	Division Prop.

Statements	Justifications
2. $1 + 5b + b = 1$	Given
$1 + 6b = 1$	CLT
$\begin{array}{r} 1 + 6b = 1 \\ -1 \quad -1 \\ \hline 6b = 0 \\ \frac{6}{6} \quad \frac{6}{6} \\ \hline b = 0 \end{array}$	Subtraction Prop.
	Division Prop.

Statements	Justifications
3. $4 + 8(2r - 3) = -6r - 20$	Given
$(4) + 16r - 24 = -6r - 20$	Distribute
$\begin{array}{r} -20 + 16r = -6r - 20 \\ +6r \quad +6r \end{array}$	CLT
$\begin{array}{r} -20 + 22r = -20 \\ +20 \quad +20 \end{array}$	Add. Prop.
$\frac{22r}{22} = \frac{0}{22}$	Add. Prop.
$r = 0$	Div. Prop.

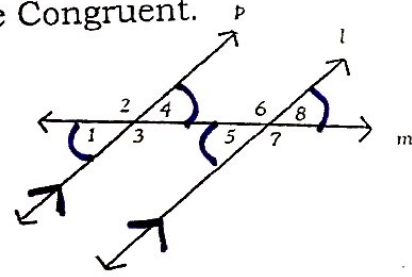
Statements	Justifications
4. $-2(2b + 7) + 2b = 4(3b - 7)$	Given
$(-4b) - 14 + 2b = 12b - 28$	Distribute
$\begin{array}{r} -2b - 14 = 12b - 28 \\ +2b \quad +2b \end{array}$	CLT
$\begin{array}{r} -14 = 14b - 28 \\ +28 \quad +28 \end{array}$	Add. Prop.
$\frac{14}{14} = \frac{14b}{14}$	Add. Prop.
$1 = b$	Div. Prop.

Proving Angle Relationships: Notes

Use Alternate Exterior Angles to prove Alternate Interior Angles are Congruent.

Given: $p \parallel l$ and m is a transversal of p and l

Prove: $\angle 4 \cong \angle 5$



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1. $p \parallel l$ and m is a transversal of p and l

2. $\angle 1 \cong \angle 8$

3. $\angle 1 \cong \angle 4, \angle 8 \cong \angle 5$

4. $\angle 8 \cong \angle 4, \angle 8 \cong \angle 5$

5. $\angle 4 \cong \angle 5$

1. Given

2. Alt. Ext. \cong

3. V.A. \cong

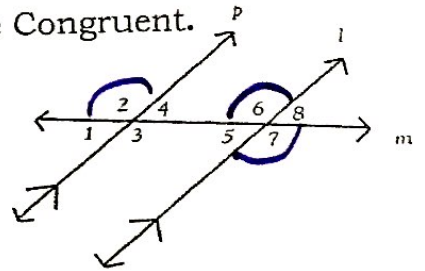
4. Substitution

5. Transitive Prop. or Subst.
if $a = b$ + $b = c$, then $a = c$

Use Alternate Exterior Angles to prove Corresponding Angles are Congruent.

Given: $p \parallel l$ and m is a transversal of p and l

Prove: $\angle 2 \cong \angle 6$



1. $p \parallel l$ and m is a transversal of p and l

2. $\angle 2 \cong \angle 7$

3. $\angle 7 \cong \angle 6$

4. $\angle 2 \cong \angle 6$

1. Given

2. Alt. Ext. \cong

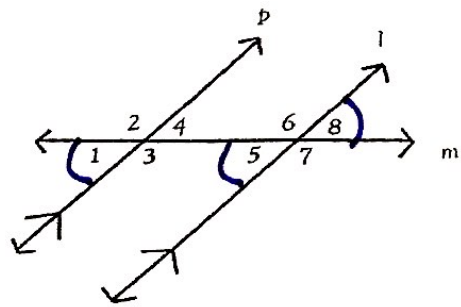
3. V.A. \cong

4. Transitive Prop.
or Subst.

Prove **Consecutive Interior Angles** are supplementary.

Given: $p \parallel l$ and m is a transversal of p and l , $\angle 1 \cong \angle 8$

Prove: $\angle 3$ and $\angle 5$ are supplementary



1. $p \parallel l$ and m is a transversal of p and l
 $\angle 1 \cong \angle 8$

2. $\angle 1 + \angle 3 = 180$

3. $\angle 8 \cong \angle 5$

4. $\angle 1 \cong \angle 5$

5. $\angle 5 + \angle 3 = 180$

6. $\angle 3 + \angle 5$ are supp.

1. Given

2. L.P. Supp.

3. V.A. \cong

4. Substitution or Trans.

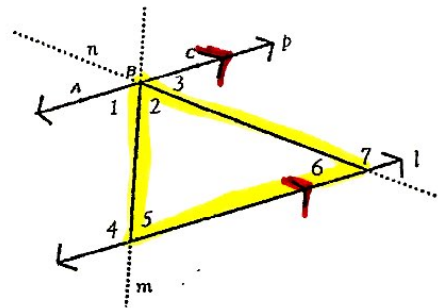
5. Subst.

6. Def of supp.

Prove the **Triangle Sum Theorem**

Given: $p \parallel l$ and m is a transversal of p and l

Prove: $m \angle 5 + m \angle 2 + m \angle 6 = 180$



1. $p \parallel l$ and m is a transversal of p and l

2. $\angle 1 + \angle 2 + \angle 3 = 180$

3. $\angle 1 \cong \angle 5$, $\angle 3 \cong \angle 6$

4. $\angle 5 + \angle 2 + \angle 6 = 180$

1. Given

2. Def. of straight angle

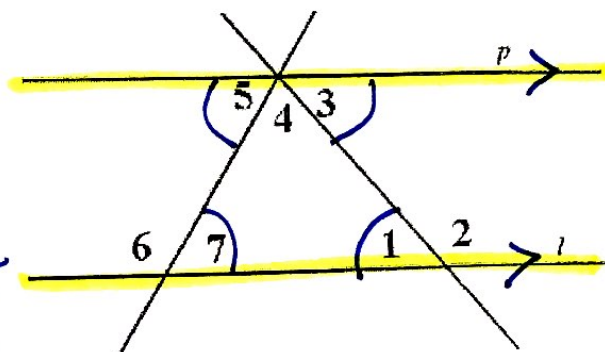
3. Alt. Int. \cong

4. Subst.

Parallels Cut by Transversals Proofs HW

1. Given: $\angle 7 \cong \angle 1$ and $l \parallel p$

Prove: $\angle 5 \cong \angle 3$



1. $\angle 7 \cong \angle 1$ and $l \parallel p$

2. ~~$\angle 7 \cong \angle 5$, $\angle 3 \cong \angle 1$~~

3. $\angle 7 \cong \angle 3$

4. $\angle 5 \cong \angle 3$

1. Given

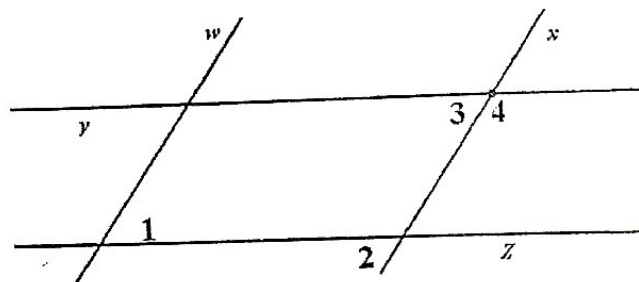
2. Alt. Int \cong

3. Substitution or Trans.

4. Trans or subst.

2. Given: $w \parallel x$ and $y \parallel z$

Prove: $\angle 1$ and $\angle 4$ are supplementary



1. $w \parallel x$ and $y \parallel z$

2. $\angle 1 \cong \angle 2$

3. $\angle 2 \cong \angle 3$

4. $\angle 3 + \angle 4 = 180$

5. $\angle 2 + \angle 4 = 180$

6. $\angle 1 + \angle 4 = 180$

7. $\angle 1$ and $\angle 4$ are supplementary

1. _____

2. _____

3. _____

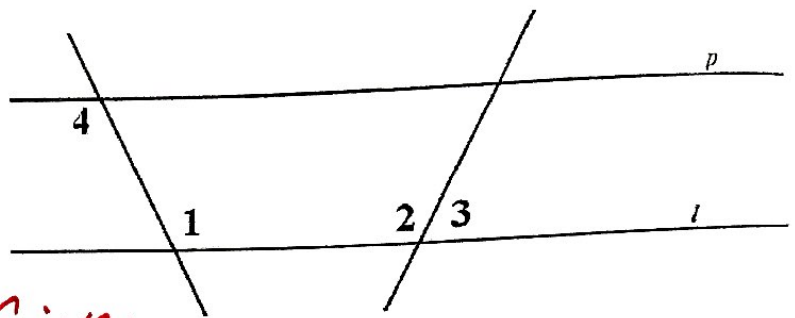
4. _____

5. _____

6. _____

7. _____

3. Given: $\angle 1 \cong \angle 2$ and $l \parallel p$
 Prove: $\angle 3 + \angle 4 = 180^\circ$



1. $\angle 1 \cong \angle 2$ and $l \parallel p$

2. _____

3. _____

4. _____

5. $\angle 3 + \angle 4 = 180^\circ$

1. Given

2. _____

3. _____

4. _____

5. _____