Intro to Proofs Using Algebra

- two-column proof:

"Justification"

Given: ....

Prove: ....

Statement	Reason
1. [ ]	1. Given
2.	2. .....
3.	3. .....
.....	
4. ( )	4. .....

▨ or QED

Ex:

Given: $x - 3 = 9$

Prove: $x = 12$

Statement	Reason
1. $x - 3 = 9$	1. Given
2. $x - 3 + 3 = 9 + 3$; $x = 12$	2. Addition Prop.

▨

$x - 3 = 9$

$+3 \quad +3$

$x = 12$

Ex: Given: $2x - 7 = 37$
Prove: $x = 22$

$2x - 7 = 37$
$+7 \quad +7$ Add'n prop
$\frac{2x}{2} = \frac{44}{2}$ Division prop.
$x = 22$

Statement	Reason
1. $2x - 7 = 37$	1. Given
2. $2x - 7 + 7 = 37 + 7$; $2x = 44$	2. Addition Prop.
3. $\frac{2x}{2} = \frac{44}{2}$; $x = 22$	3. Division Prop.
	QED

Ex: Given: $-3(p - 9) = 18$
Prove: $p = 3$

Statement	Reason
1. $-3(p-9) = 18$	1. Given
2. $\frac{-3(p-9)}{-3} = \frac{18}{-3}$; $p - 9 = -6$	2. Division Prop.
3. $p - 9 + 9 = -6 + 9$; $p = 3$	3. Addition Prop.
	▨

① $-3(p-9) = 18$
$-3p + 27 = 18$
② $-27 \quad -27$
$-3p = -9$
③ $\frac{-3p}{-3} = \frac{-9}{-3}$
$p = 3$

* ① $\frac{-3(p-9)}{-3} = \frac{18}{-3}$
② $p - 9 = -6$
$+9 \quad +9$
$p = 3$