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## **TOC pg 53 U2- Algebraic Proofs**

<b>ALGEBRAIC PROPERTIES OF EQUALITY</b>	
<b>ADDITION PROPERTY OF EQUALITY</b>	If $a = b$ , then $a + c = b + c$
<b>SUBTRACTION PROPERTY OF EQUALITY</b>	If $a = b$ , then $a - c = b - c$
<b>MULTIPLICATION PROPERTY OF EQUALITY</b>	If $a = b$ , then $a \cdot c = b \cdot c$
<b>DIVISION PROPERTY OF EQUALITY</b>	If $a = b$ , then $\frac{a}{c} = \frac{b}{c}$
<b>DISTRIBUTIVE PROPERTY OF MULTIPLICATION OVER ADDITION or OVER SUBTRACTION</b>	$a(b + c) = ab + ac$ $a(b - c) = ab - ac$
<b>SUBSTITUTION PROPERTY OF EQUALITY</b>	If $a = b$ , then $b$ can be substituted for $a$ in any equation or expression
<b>REFLEXIVE PROPERTY OF EQUALITY</b>	For any real number $a$ , $a = a$
<b>SYMMETRIC PROPERTY OF EQUALITY</b>	If $a = b$ , then $b = a$
<b>TRANSITIVE PROPERTY OF EQUALITY</b>	If $a = b$ and $b = c$ , then $a = c$

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# WWK

Distributive property	When given a number & an expression in ( ), multiply the number times each term of the expression.	$5(x-10)$ $5x-50$
Commutative property	In addition & multiplication the order of the terms does not matter.	$2+3=3+2$
Reflexive property	For any number, it will always equal itself	$17=17$
Substitution property	If 2 terms are equal, then you can substitute one in for the other.	Find $x=5$ $x+2=?$

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## TOC pg 53 U2- Algebraic Proofs

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

Prove:  $x = 6$

Statements	Reasons
1. $3x + 12 = 8x - 18$	1. Given
2. $12 = 5x - 18$	2. Subtraction POE
3. $30 = 5x$	3. Addition POE
4. $6 = x$	4. Division POE
5. $x = 6$	5. Symmetric POE

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Given:  $7y - 84 = 2y + 61$

Prove:  $y = 29$

Statements	Reasons
1. $7y - 84 = 2y + 61$	1. Given
2. $7y = 2y + 145$	2. Addition
3. $\frac{5y}{5} = \frac{145}{5}$	3. Subtraction
4. $y = 29$	4. Division POE

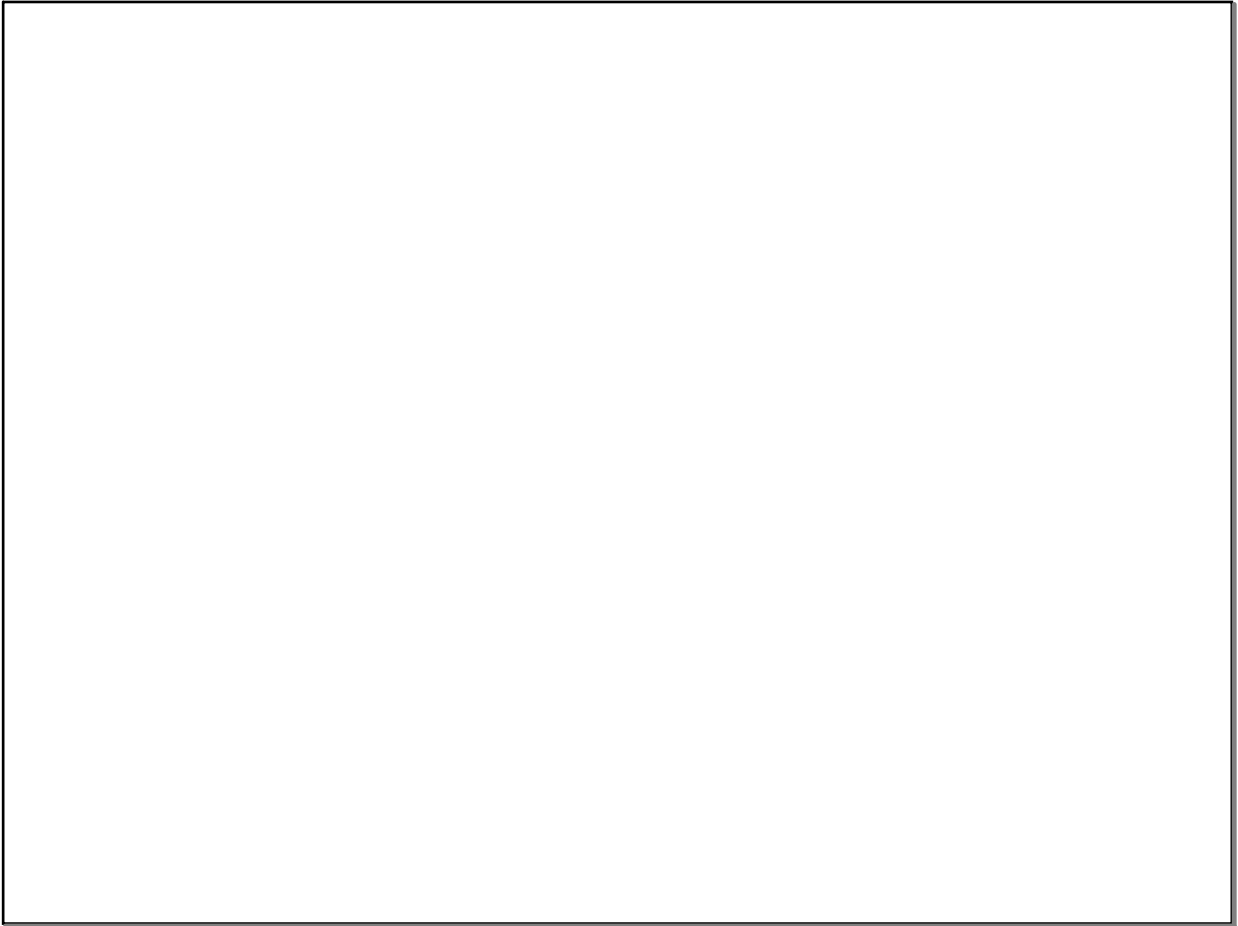
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Given:  $4(5n + 7) - 3n = 3(4n - 9)$

Prove:  $n = -11$

Statements	Reasons
1. $4(5n + 7) - 3n = 3(4n - 9)$	Given
2. $20n + 28 - 3n = 12n - 27$	2. Distributive Prop
3. $17n + 28 = 12n - 27$	3. Combine like terms
4. $-12n + 28 = -27$ $5n + 28 = -27$	4. Subtraction POE
5. $5n = -55$	5. Subtraction POE
6. $n = -11$	6. Division POE

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