

Properties of Equality	MHC-071
Properties that govern the Equal sign =	10-6-25

The Reflexive Property

$$a = a$$

The Symmetric Property

If $a = b$, then $b = a$

The Transitive Property

If $a = b$ and $b = c$, then $a = c$

The Substitution Property

If $a=b$, then a can be substituted for b in any equation

The Addition and Subtraction Properties

If $a = b$, then $a + c = b + c$ and $a - c = b - c$

If $a = b$ and $c = d$, then $a + c = b + d$ and $a - c = b - d$

The Multiplication Properties

If $a = b$, then $a * c = b * c$

If $a = b$ and $c = d$, then $a * c = b * d$

The Division Properties

If $a = b$ and $c \neq 0$ then $a/c = b/c$

If $a=b$ and $c = d \neq 0$, then $a/c = b/d$

The Square Root Property*

$$\text{If } a = b \geq 0 \text{ then } \sqrt{a} = \sqrt{b}$$

* Assumes only the principle of positive square root

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Example Problem

Equation	$7 + x = 4(x - 2)$	
Solution	$7 + x = 4(x - 2)$	Distributive Property
	$7 + x = 4x - 8$	Transitive Property
	$7 = 3x - 8$	Subtraction Property
	$15 = 3x$	Addition Property
	$5 = x$	Division Property
	$x = 5$	Symmetric Property