"I Can Combine Like Terms to Simplify and Generate Equivalent Expressions."

Equivalent Expressions

One of the most important properties to remember when simplifying expressions is the **Commutative Property** where we can move terms around so that the **Like Terms** are right next to each other. With this property in mind and to save time we can put different shapes around like terms **and their signs** to combine them.

$5x+7-3x+4$	$a+4b-3b+2a+9b$	$8+7p-4q+3p-1+10q$

But... When we have to ALWAYS perform the **Distributive Property** when needed before combining like terms.

$4x+3(2x-9)$	$2a+4(3a-b)+7b$

Let's try a Couple More

1. $5(6x)$	2. $2x+5y+7x$	3. $2a+3b+a+7$
4. $2(x+6)-8$	5. $3b+4(2a+4b)$	6. $4(7x+5y)-8x-7y$

This question appeared on the NYS test last year…

Jimmy and 3 of his classmates wrote expressions that they all felt were equivalent. Jimmy wrote the expression $4x+8y$ and then looked at his classmates expressions that did not look at all like his. Decide which, if any, of the below expressions are equivalent to Jimmy's.

Mary Beth: $5y+2(2x+3y)$

Jesse: $2(2y)+2(2y)+2(2x)$

Samantha: $4(x+3y)-4y$

First let's answer by simplifying each expression

Mary Beth	Jesse	Samantha

To check our thoughts, let's plug in some values for x and y see what happens.

Let x = 4 and y = 3

Jimmy: $4x+8y$	Mary Beth: $5y+2(2x+3y)$
Jesse: $2(2y)+2(2y)+2(2x)$	Samantha $4(x+3y)-4y$

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Equivalent Expressions

One of the most important properties to remember when simplifying expressions is the **Commutative Property** where we can move terms around so that the **Like Terms** are right next to each other. With this property in mind and to save time we can put different shapes around like terms **and their signs** to combine them.

$5x+7-3x+4$

$2x+11$

$a+4b-3b+2a+9b$

$3a+10b$

$8+7p-4q+3p-1+10q$

$10p+6q+7$

But... When we have to, ALWAYS perform the **Distributive Property** when needed before combining like terms.

$4x+3(2x-9)$

$4x+6x-27$

$10x-27$

$2a+4(3a-b)+7b$

$2a+12a-4b+7b$

$14a+3b$

Let's try a Couple More

1. $5(6x)$ $30x$	2. $2x+5y+7x$ $9x+5y$	3. $2a+3b+a+7$ $3a+3b+7$
4. $2(x+6)-8$ $2x+12-8$ $2x+4$	5. $3b+4(2a+4b)$ $3b+8a+16b$ $19b+8a$	6. $4(7x+5y)-8x-7y$ $28x+20y-8x-7y$ $20x+13y$

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First let's answer by simplifying each expression

Mary Beth

$5y+2(2x+3y)$

$5y+4x+6y$

$4x+11y$ 11

Jesse

$2(2y)+2(2y)+2(2x)$

$4y+4y+4x$

$8y+4x$ 11

$4x+8y$ CP

Samantha

$4(x+3y)-4y$

$4x+12y-4y$

$4x-8y$ 11

To check our thoughts, let's plug in some values for x and y see what happens.

Let $x = 4$ and $y = 3$

Jimmy:

$4x+8y$

$4\cdot4+8\cdot3$

$16+24$

40

Mary Beth:

$5y+2(2x+3y)$

$5\cdot3+2\cdot(2\cdot4+3\cdot3)$

$5\cdot3+2\cdot(8+9)$

$5\cdot3+2\cdot17$

$15+34$

49 11

Jesse:

$2(2y)+2(2y)+2(2x)$

11

$2(2\cdot3)+2(2\cdot3)+2(2\cdot4)$

$12+12+16$

40

Samantha

$4(x+3y)-4y$

11

$4\cdot(4+3\cdot3)-4\cdot3$

$4+9$

$4\cdot13-4\cdot3$

$52-12$

40