Get out your homework and start checking/correcting your answers.

Classwork - Simplifying Expressions with Like Terms and Distributive Property

1) For each expression below, use the distributive property to simplify the expression. <u>Use an area model</u> for the factored part of the expression to find the expanded form of the expression. <u>Rewrite the simplified expression.</u>

A) $3(x + 5)$

$3 \boxed{\begin{array}{c|c} 3x & +15 \end{array}}$
$\quad\; x \quad\; +5$

$\boxed{3x + 15}$

B) $2(x - 7)$

$2 \boxed{\begin{array}{c|c} 2x & -14 \end{array}}$
$\quad\;\; x \quad -7$

$\boxed{2x - 14}$

C) $5(3x - 2)$

$5 \boxed{\begin{array}{c|c} 15x & -10 \end{array}}$
$\quad\;\; 3x \quad -2$

$15x - 10$

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

$-4 \boxed{\begin{array}{c|c} -8x & -12 \end{array}}$
$\quad\;\; 2x \quad +3$

$\boxed{-8x - 12}$

E) $-6(x - 4)$

$-6 \boxed{\begin{array}{c|c} -6x & +24 \end{array}}$
$\quad\;\; x \quad -4$

$\boxed{-6x + 24}$

F) $2(-2x + 5)$

$2 \boxed{\begin{array}{c|c} -4x & +10 \end{array}}$
$\quad\; -2x \quad +5$

$\boxed{-4x + 10}$

2) Simplify each expression to decide whether the 2 expressions are equivalent or not. Show work to prove your answer. _Equivalent expressions have the same simplified expression after you combine like terms._

A) **Expression #1**

$4(2x + 3)$

$4 \lfloor 8x \rfloor \lceil +12 \rceil$

$2x \quad +3$

$\boxed{8x+12}$

Expression #2

$6x + 12 - 2x - 3$

$4x + 9$

Equivalent: Yes OR No

B) **Expression #1**

$3(5x - 2)$

$3 \lceil 15x \rceil \lceil -6 \rceil$

$5x \quad -2$

$\boxed{15x-6}$

Expression #2

$8x + 2 + 7x - 8$

$15x - 6$

Equivalent: Yes OR No

Warm Up: Create an area model to do the distributions below. Remember, the operation goes with the number after it in your area model. Then find the area of each box, then write the expanded form.

A) $7(x-4)$

$7x - 28$

$$7 \begin{array}{|c|c|} \hline 7x & -28 \\ \hline \end{array}$$
$\quad x \quad -4$

B) $-3(2x-5)$

$-6x + 15$

$$-3 \begin{array}{|c|c|} \hline -6x & +15 \\ \hline \end{array}$$
$\quad 2x \quad -5$

C) $10(-4x+2)$

$-40x + 20$

$$10 \begin{array}{|c|c|} \hline -40x & +20 \\ \hline \end{array}$$
$\quad -4x \quad +2$

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

$$-2 \begin{array}{|c|c|} \hline -6x & -8 \\ \hline \end{array}$$
$\quad 3x \quad +4$

$-6x - 8$

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

$$4 \begin{array}{|c|c|} \hline -12x & +8 \\ \hline \end{array}$$
$\quad -3x \quad +2$

$-12x + 8$

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

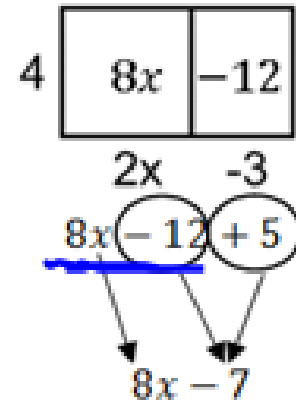$$5 \begin{array}{|c|c|} \hline 15x & +10y \\ \hline \end{array}$$
$\quad 3x \quad +2y$

$15x + 10y$

When simplifying expressions involving the distributive property and combing like terms you want to follow the order of operations.

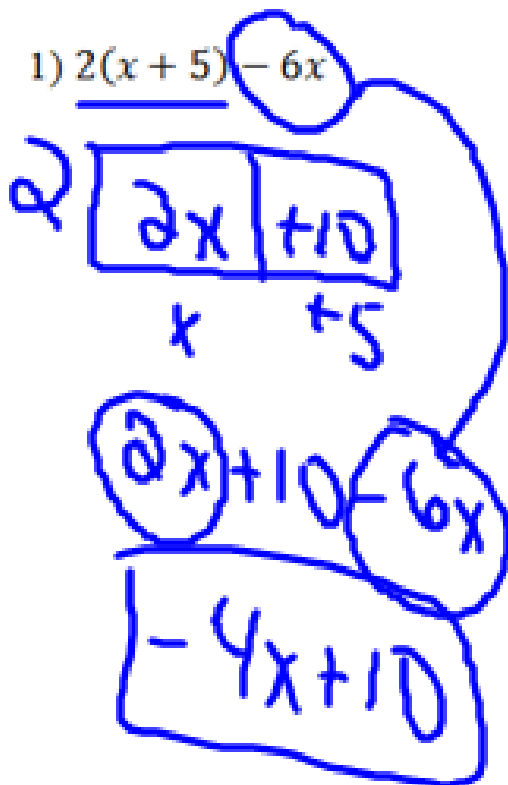**Simplify the following expressions.**

Example: $4(2x - 3) + 5$

1) Create an area model to distribute the number (SIGN INCLUDED) we are multiplying everything inside the parentheses by.
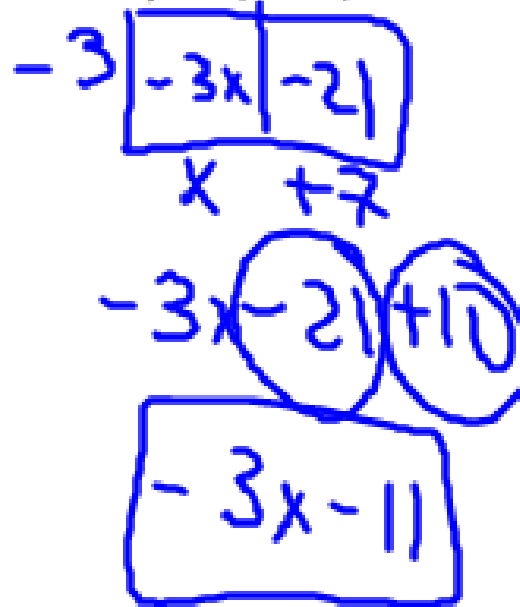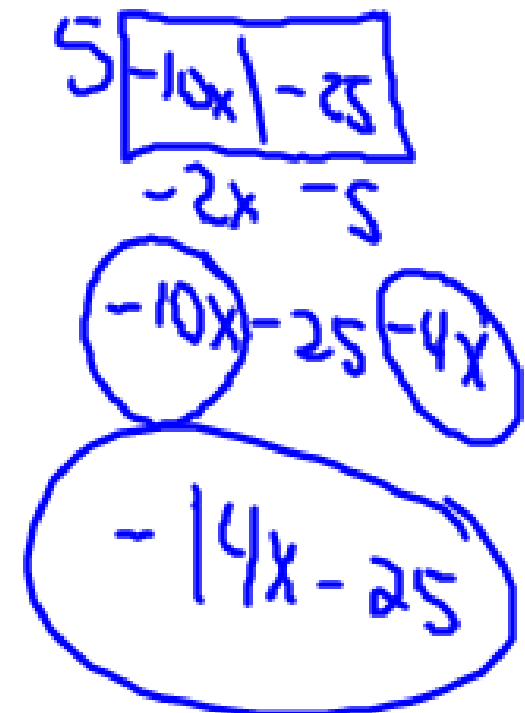
2) Rewrite the expression.

3) Combine like terms

| 4 | $8x$ | -12 |

2x   -3

$8x(-12)(+5)$

$8x - 7$

1) $2(x + 5) - 6x$

2

| $2x$ | $+10$ |

x   +5

$(2x)+10(-6x)$

$-4x + 10$

2) $-3(x + 7) + 10$

-3 | $-3x$ | -21 |

x   +7

$-3x(-21)(+10)$

$-3x - 11$

3) $5(-2x - 5) - 4x$

5 | $-10x$ | -25 |

$-2x$ -5

$(-10x)-25(-4x)$

$-14x - 25$

4) $-4(4x - 2) + 5x$

-4 | $-16x$ | $+8$

$4x$ -2

$(-16x) + 8$ $(+5x)$

$(-11x + 8)$

5) $4x - 2(x + 1)$

-2 | $-2x$ | -2

x $+1$

$(4x)(-2x) - 2$

$2x - 2$

6) $-3x - 4(2x + 3)$

-4 | $-8x$ | -12

$2x$ $+3$

$(-3x)(-8x) - 12$

$-11x - 12$

7) $6 + 3(-x + 5)$

3 | $-3x$ | $+15$
$-x$ | $+5$

$6 - 3x + 15$

$-3x + 21$

8) $10(x - 2) - 8x + 5$

10 | $10x$ | -20
x | -2

$10x - 20 - 8x + 5$

$2x - 15$

9) $5(x + 4) - 2x - 8$

5 | $5x$ | $+20$
x | $+4$

$5x + 20 - 2x - 8$

$3x + 12$

10) $\frac{1}{2}(4x - 8) - 5$

$\frac{1}{2}$ | $2x$ | -4
$4x$ | -8

$2x - 4 - 5$

$2x - 9$

11) $7x - (3x + 5)$

-1 | $-3x$ | -5
$3x$ | $+5$

$7x - 3x - 5$

$4x - 5$

12) $4(2x + 3y) - 5x$

4 | $8x$ | $+12y$
$2x$ | $+3y$

$8x + 12y - 5x$

$3x + 12y$

The following problems will require 2 different area models. After you create the expanded expression, simplify like terms.

13) $6(x+1) + 2(x-4)$

$$6 \boxed{\begin{array}{c|c} 6x & +6 \end{array}} \quad +2 \boxed{\begin{array}{c|c} 2x & -8 \end{array}}$$
$$\quad x \quad +1 \qquad\qquad x \quad -4$$

$\boxed{6x + 6} + \boxed{2x - 8}$

$\boxed{8x - 2}$

14) $3(x-2) - 2(4x+2)$

$$3 \boxed{\begin{array}{c|c} 3x & -6 \end{array}} \quad -2 \boxed{\begin{array}{c|c} -8x & -4 \end{array}}$$
$$\quad x \quad -2 \qquad\qquad 4x \quad +2$$

$\boxed{3x - 6} \boxed{-8x - 4}$

$\boxed{-5x - 10}$
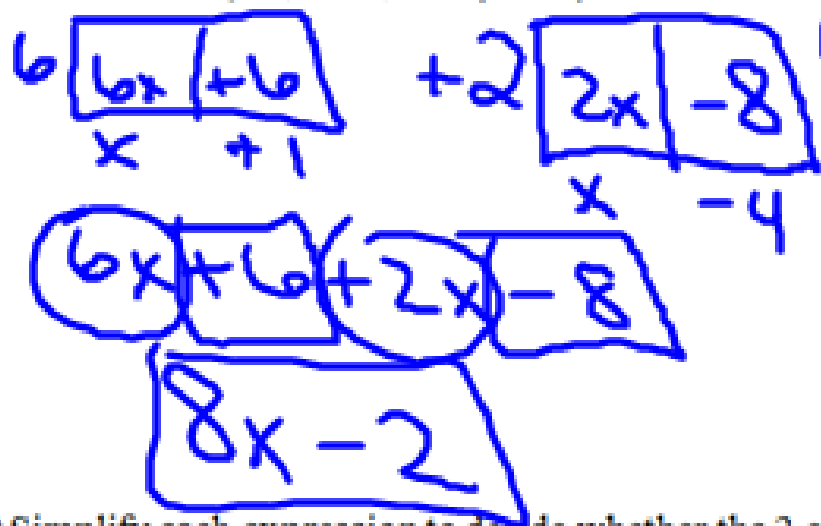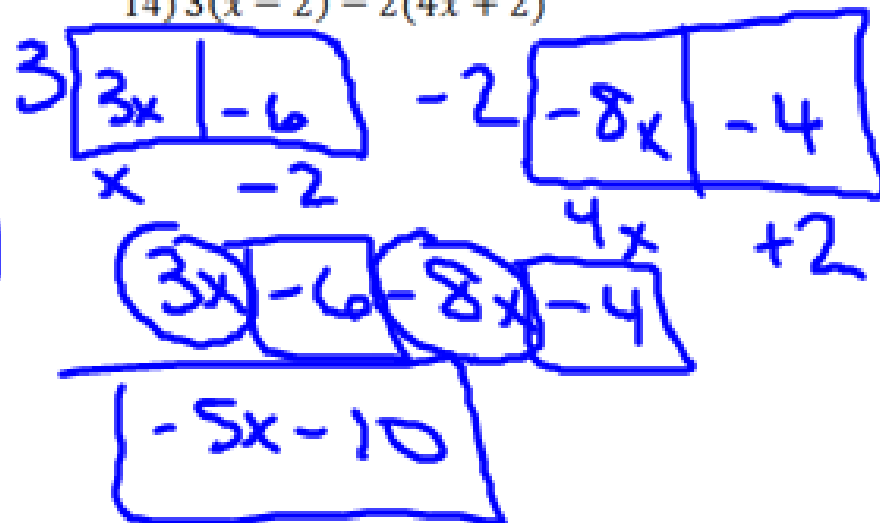
15) Simplify each expression to decide whether the 2 expressions are equivalent or not. Show work to prove your answer. *Equivalent expressions have the same simplified expression after you combine like terms.*
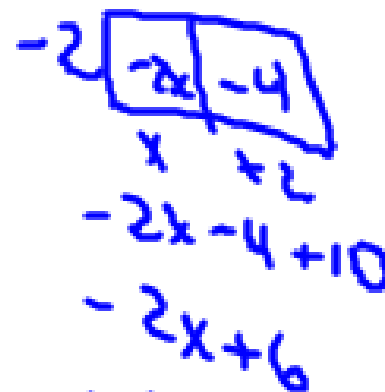
A)

Expression #1
$5x + 4 - 7x + 2$

$^-2x + 6$

(Circle Your Answer)

(Equivalent)

Not Equivalent

Expression #2
$-2(x+2) + 10$

$$-2 \boxed{\begin{array}{c|c} -2x & -4 \end{array}}$$
$$\quad x \quad +2$$

$-2x - 4 + 10$

$-2x + 6$

B)

Expression #1
$-8x + 5 + 3x - 9$

$^-5x - 4$

(Circle Your Answer)

Equivalent

(Not Equivalent)

Expression #2
$-2(2x+2) + x$

$-3x - 4$

$$-2 \boxed{\begin{array}{c|c} -4x & -4 \end{array}}$$
$$\quad 2x \quad +2$$

$-4x - 4 + x$