Concept: Subtracting Expressions

Name:

COMPUTER COMPONENT

Instructions: In UMATH X follow the **Content Menu** path:

Algebra > Subtracting Expressions

Work through all Sub Lessons of the following Lessons **in order**:

- *Our Problem*
- *Subtracting Expressions With x and y Tiles*
- *Subtracting Expressions With x-Squared Tiles*
- *Subtracting Expressions Without Tiles*

Additional Required Materials: Pencil, colored pencils, ruler

As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

OFF COMPUTER EXERCISES

We know that…

When we subtract integers, we simply ***add*** the opposite.

1. Use the above rule to answer the following (the first one is done for you):

(a) (+3) - (+4)

= **(+3) + (-4)**

= **+3 – 4**

= **-1**

(b) (-3) - (+2)

= **(-3) + (-2)**

= **-3 - 2**

= **- 5**

(c) (+4) - (-10)

= **(+4) + (+10)**

= **+4 + 10**

= **+ 14**

(d) (-3) - (-5)

= **(-3) + (+5)**

= **-3 + 5**

= **+ 2**

(e) (+8) – (+ 8)

= **(+8) + (-8)**

= **+8 - 8**

= **0**

(f) (+9) – (-1)

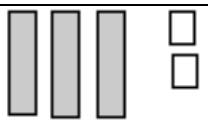
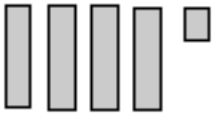
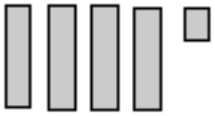
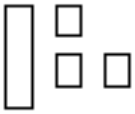
= **(+9) + (+1)**

= **+9 + 1**

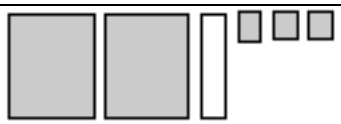
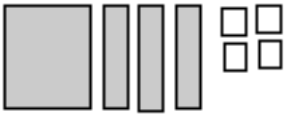
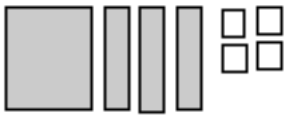
= **+ 10**

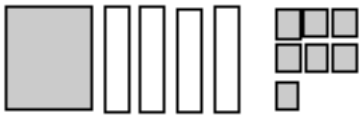
2. Answer the ***two*** questions below by completing the chart. ***Tip:*** *Use tiles and their drawings to help you visualize the subtracting of expressions.*

FIRST

(a) Represent the expression 3x - 2 by using tiles. Draw your tiles in the space to the right.	
(b) Represent the expression 4x + 1 by using tiles. Draw your tiles in the space to the right.	
(c) Before we can subtract (b) from (a), we need to add more tiles without changing the value. (the zero property) Re-draw your answer to (a).	
(d) Re-draw the expression 4x +1 from 1(b). -	
(e) Now subtract (d) from (c). Remember that opposite tiles will cancel each other. (3x - 2) – (4x + 1) =	
(f) Write the algebraic expression to (e)	***-x - 3***

SECOND

(a) Represent the expression $2x^2$ – x + 3 by using tiles. Draw your tiles in the space to the right.	
(b) Represent the expression x^2 + 3x - 4 by using tiles. Draw your tiles in the space to the right.	
(c) Before we can subtract (b) from (a), we need to add more tiles without changing the value. (the zero property) Re-draw your answer to (a).	
(d) Re-draw the expression x^2 + 3x - 4 from 2 (b). -	

(e) Now subtract (d) from (c). Remember that opposite tiles will cancel each other. $(2x^2 – x + 3) – (x^2 + 3x – 4)$ =	
(f) Write the algebraic expression to (e)	$x^2 – 4x + 7$

3. Use your '*Brilliant Brain Matter*' to simplify the following expressions. Test yourself and resist the temptation to use tiles this time.

Remember: ***We know that…***

When we subtract integers, we simply add the opposite.

Example: **(6p + 3pq - 3p) - (3p - 5pq - 4p)**

= (6p + 3pq - 3p) + (-3p + 5pq + 4p) Add the opposite

= 6p + 3pq - 3p - 3p + 5pq + 4

= 6p - 3p - 3p + 4p + 3pq + 5pq Rearrange and group like terms

= 4p + 8pq Simplify

(a) (5x + 4) - (3x + 5)

= ***(5x + 4) + (-3x – 5)***

= ***5x + 4 – 3x - 5***

= ***5x – 3x + 4 - 5***

= ***2x – 1***

(b) $(y^2 - 3y + 5) - (2y^2 + 3y - 9)$

= $(y^2 - 3y + 5) + (-2y^2 - 3y + 9)$

= $y^2 - 3y + 5 - 2y^2 - 3y + 9$

= $y^2 - 2y^2 – 3y - 3y + 5 + 9$

= $-y^2 – 6y + 14$

(c) $(9 - 2b + 3b^2) - (-3b^2 - b + 4)$

= $(9 - 2b + 3b^2) + (+ 3b^2 + b - 4)$

= $9 - 2b + 3b^2 + 3b^2 + b - 4)$

= $3b^2 + 3b^2 - 2b + b + 9 - 4$

= $6b^2 - b + 5$

(d) 13a - (7a - 4)

= 13a + (-7a + 4)

= 13a – 7a + 4

= 6a + 4

(e) $(3m^2 + 6m - 3) - (4m^2 - m + 1)$

$= (3m^2 + 6m - 3) + (-4m^2 + m - 1)$

$= 3m^2 + 6m - 3 - 4m^2 + m - 1$

$= 3m^2 – 4m^2 + 6m + m – 3 - 1$

$= - m^2 + 7m - 4$

(f) $(5x + 4xy - 2x) - (6x - 2xy + 4)$

$= (5x + 4xy - 2x) + (-6x + 2xy - 4)$

$= 5x + 4xy – 2x - 6x + 2xy - 4$

$= 5x – 6x – 2x + 4xy + 2xy - 4$

$= - 3x + 6xy - 4$

(g) $(k^2 - 3k + 3) - (3k^2 + 5k - 2) - (k^2 + 1)$

$= (k^2 - 3k + 3) + (-3k^2 - 5k + 2) + (-k^2 - 1)$

$= k^2 - 3k + 3 -3k^2 - 5k + 2 -k^2 - 1)$

$= k^2 - 3k^2 – k^2 – 3k – 5k + 3 + 2 - 1$

$= -3k^2 – 8k + 4$

(h) $(-2w^2 - w + 8) - (3w^2 + 4) + (w^2 - 2w + 5)$

$= (-2w^2 - w + 8) + (-3w^2 - 4) + (w^2 - 2w + 5)$

$= -2w^2 - w + 8 - 3w^2 - 4 + w^2 - 2w + 5$

$= - 2w^2 – 3w^2 + w^2 – w – 2w + 8 – 4 + 5$

$= - 4w^2 – 3w + 9$

(i) $6d - (-3d^2 - 2d + 1) + (4d^2 - d) - (4d^2 + 5d + 9)$

$= 6d + (+3d^2 +2d - 1) + (4d^2 - d) + (- 4d^2 - 5d - 9)$

$= 6d +3d^2 +2d - 1 + 4d^2 - d - 4d^2 - 5d - 9$

$= 3d^2 + 4d^2 – 4d^2 + 2d – 5d - d + 6d – 1 - 9$

$= 3d^2 + 2d -10$