

Name: _____ Date: _____ Period: _____

Algebra 1B Discovery Activity on Completing the Square

I) Using algebra tiles complete the following sets of tables. If it is not possible to complete the square using algebra tiles for any of these, write “not possible” in the second column.

Set A

Expression	Number of 1-tiles needed to complete the square	Expression written as a square
$x^2 + 2x + ?$		
$x^2 + 4x + ?$		
$x^2 + 6x + ?$		
$x^2 + 8x + ?$		
$x^2 + 10x + ?$		
$x^2 + 12x + ?$		

Set B

Expression	Number of 1-tiles needed to complete the square	Expression written as a square
$x^2 - 2x + ?$		
$x^2 - 4x + ?$		
$x^2 - 6x + ?$		
$x^2 - 8x + ?$		
$x^2 - 10x + ?$		
$x^2 - 12x + ?$		

Set C

Expression	Number of 1-tiles needed to complete the square	Expression written as a square
$x^2 + 5x + ?$		
$x^2 - 5x + ?$		

Set D

Expression	Number of 1-tiles needed to complete the square	Expression written as a square
$-x^2 + 2x + ?$		
$-x^2 - 4x + ?$		

Set E

Expression	Number of 1-tiles needed to complete the square	Expression written as a square
$2x^2 + 6x + ?$		
$3x^2 - 10x + ?$		

II) Now use the information above to complete the following table:

Set name	Possible or not possible to turn into squares? (Circle your answer.)	What do the expressions in the set have in common?	If not possible, why was it not possible?
Set A	Possible Not possible		

Set name	Possible or not possible to turn into squares? (Circle your answer.)	What do the expressions in the set have in common?	If not possible, why was it not possible?
Set B	Possible Not possible		
Set C	Possible Not possible		
Set D	Possible Not possible		
Set E	Possible Not possible		

III) For the sets that were possible, look for patterns in the last column of your tables, and answer the following questions.

1) Are the 1-tiles that you used to complete the squares positive, negative, or both? Why is that?

2) Consider the general statement $x^2 + bx + c = (x + d)^2$

a) How is d related to b in each case?

b) How is c related to b in each case?

c) How can you obtain the numbers in the second column of the table directly from the coefficients of x in the expressions from the first column?

IV) Now, use the shortcuts that you found in part III to find the value of c and d in the following expressions:

1) $x^2 + 14x$ _____ = (_____)²

6) $x^2 + 50x$ _____ = (_____)²

2) $x^2 - 30x$ _____ = (_____)²

7) $x^2 - 22x$ _____ = (_____)²

3) $x^2 + 16x$ _____ = (_____)²

8) $x^2 - 18x$ _____ = (_____)²

4) $x^2 + 20x$ _____ = (_____)²

9) $x^2 - 92x$ _____ = (_____)²

5) $x^2 - 46x$ _____ = (_____)²

10) $x^2 + 68x$ _____ = (_____)²