

Names: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

**Discovery activity on perfect square trinomials**

1) Use the big X to factor out the following polynomials. Note: They are all factorable.

A)  $4r^2 - 12r + 9$

B)  $16x^2 + 40x + 25$

C)  $25k^2 - 80k + 64$

2) What kind of numbers are the “a” terms in all of the trinomials above, and what kind of sign do they have?

3) What kind of numbers are the “c” terms in all of the trinomials above, and what kind of sign do they have?

4) Now look at the binomials that resulted after you factored out the trinomials. What do you notice about both binomials?

5) In which other way can you represent the binomials in your factorizations?

A) \_\_\_\_\_ B) \_\_\_\_\_ C) \_\_\_\_\_

6) What kind of relationship is there between the numbers in your binomials with which you ended up and the “a” and “c” terms in the trinomials with which you started?

7) What do you notice between the sign of your second term in your binomials with which you ended up and the signs of the second term in the trinomials with which you started?

8) What can you do to the two numbers in the binomials in your factorization to get the middle term in your original trinomials?

9) Putting all of that information together, what shortcut can you do to factor out these kinds of trinomials so that you won't have to do the big X?

10) Rewrite your shortcut into a formula with variables instead of constants (numbers) that you could use every time.

For the trinomials to the left, determine whether the following trinomials are perfect square trinomials. Write "yes" or "no". For the trinomials on the right, use your shortcut and/or formula to factor them out (the ones on the right are all perfect square trinomials).

1.  $a^2 + 4a + 4$

2.  $x^2 - 10x - 100$

3.  $n^2 - 13n + 36$

4.  $y^2 - 8y + 10$

5.  $4x^2 - 4x + 1$

6.  $9b^2 - 6b + 1$

7.  $a^2 + 12a + 36$

8.  $n^2 - 8n + 16$

9.  $x^2 + 6x - 9$

10.  $121y^2 + 22y + 1$

1)  $16x^2 + 40x + 25$

3)  $121m^2 - 198m + 81$

5)  $100b^2 - 180b + 81$

7)  $25n^2 - 40n + 16$

9)  $36x^2 - 60x + 25$

11)  $25k^2 - 80k + 64$

13)  $4n^2 - 28n + 49$

15)  $121n^2 - 110n + 25$

2)  $36v^2 - 132v + 121$

4)  $49p^2 - 28p + 4$

6)  $25x^2 + 110x + 121$

8)  $144x^2 + 264x + 121$

10)  $4a^2 - 36a + 81$

12)  $r^2 - 22r + 121$

14)  $100n^2 - 60n + 9$

16)  $x^2 + 24x + 144$