Factoring Trinomials Guided Notes

Name: _____

Pd: _____

Factoring Trinomials

Clear Targets:

- I can factor trinomials with and without a leading coefficient.

Concept:

When factoring polynomials, we are doing reverse multiplication or "un-distributing."

Remember: Factoring is the process of finding the factors that would multiply together to make a certain polynomial.

Example A. Multiply: $6b(3b^2 - 7b - 4)$	Factor by GCF: $18b^3 - 42b^2 - 24b$
Example B. Multiply: $(3x^2 - 1)(7x + 6)$	Factor by Grouping: $21x^3 + 18x^2 - 7x - 6$

Strategy:

Strategy for Factoring Trinomials:

Step 1: Multiply the first and third coefficients to make the "magic number". Make sure your trinomial is in descending order.

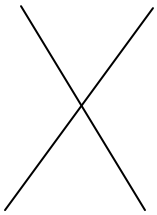
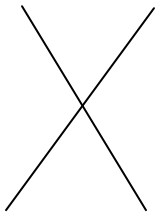
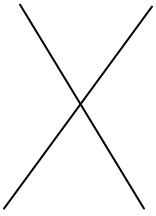
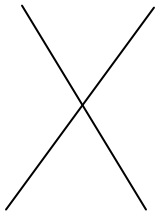
Step 2: Write out the factor table for the magic number.

Step 3: Play the "X" Game: Circle the pair of factors that adds up to equal the second coefficient. If there is no possible pair that will work, the polynomial cannot be factored using this method.

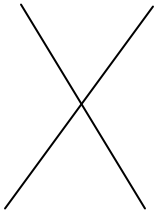
Step 4: Rewrite the middle term (the term with only an "x") of the trinomial using the pair of factors you circled.

Step 5: You should now have four terms in your polynomial, so use factor by grouping to complete the problem.

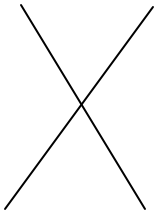
Directions: Factor each polynomial.

1. $2x^2 + 17x + 21$ 	2. $2n^2 + 15n + 7$ 
3. $m^2 + 6m - 27$ 	4. $t^2 + 7t + 10$ 

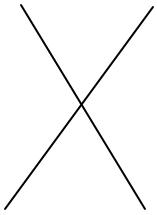
5. $9k^2 - 11k + 2$



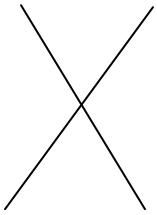
6. $y^2 - 13y + 36$



7. $m^2 - 36$



8. $8y^2 - 10y - 3$



Practice Work:

Directions: Factor each polynomial. Show all of your work!

1. $n^2 - 2n - 63$	2. $n^2 + n - 90$
3. $x^2 + 8x - 9$	4. $k^2 - 7k + 12$
5. $x^2 - 4x - 45$	6. $r^2 - 10r + 16$

Multi-Step Factoring

Sometimes, you will have to use more than one factoring strategy to complete a problem. Most commonly, you will need to pull out a GCF first, then factor the trinomial.

Practice:

7. $5n^2 + 30n + 40$	8. $6p^2 - 60p + 150$
9. $-2n^2 - 6n - 4$	10. $4r^2 + 52r + 160$
11. $5b^3 - 30b^2 + 45b$	12. $4v^3 + 48n^2 + 108n$

Due Date: _____ Name: _____ Pd: ____

Factoring Trinomials Homework

1. $k^2 + 18k + 81$	2. $v^2 - 13v + 30$
3. $v^2 + 12v + 32$	4. $x^2 - x - 6$
5. $v^2 + 14v + 48$	6. $5r^2 - 11r - 12$
7. $2p^2 - 11v - 63$	8. $3v^2 - 5v - 28$
9. $7x^2 + 52x + 60$	10. $-3x^2 + 31x - 70$

Factoring Trinomials Homework Page 2

This second parge is all multi-step factoring problems. Be sure to check for GCF first, then factor the remaining trinomial!

11. $20v^2 - 104v + 20$	12. $25x^2 - 145x + 180$
13. $18x^2 - 120x - 42$	14. $9r^2 + 87r + 54$
15. $-20b^2 + 136b + 192$	16. $-25a^2 + 185a - 70$
17. $3v^2 + 11v + 8$	18. $9p^2 - 39p - 30$
19. $2x^2 + 25x + 63$	20. $-5k^2 + 48k + 20$

Name: KEY

Pd: _____

Factoring Trinomials - KEY

Clear Targets:

- I can factor trinomials with and without a leading coefficient.

Concept:

When factoring polynomials, we are doing reverse multiplication or "un-distributing."

Remember: Factoring is the process of finding the factors that would multiply together to make a certain polynomial.

Example A. Multiply: $6b(3b^2 - 7b - 4)$ $18b^3 - 42b^2 - 24b$	Factor by GCF: $18b^3 - 42b^2 - 24b$ $6b(3b^2 - 7b - 4)$
Example B. Multiply: $(3x^2 - 1)(7x + 6)$: $21x^3 + 18x^2 - 7x - 6$	Factor by Grouping: $21x^3 + 18x^2 - 7x - 6$ $(3x^2 - 1)(7x + 6)$

Strategy:

Strategy for Factoring Trinomials:

Step 1: Multiply the first and third coefficients to make the "magic number". Make sure your trinomial is in descending order.

Step 2: Write out the factor table for the magic number.

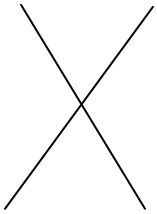
Step 3: Play the "X" Game: Circle the pair of factors that adds up to equal the second coefficient. If there is no possible pair that will work, the polynomial cannot be factored using this method.

Step 4: Rewrite the middle term (the term with only an "x") of the trinomial using the pair of factors you circled.

Step 5: You should now have four terms in your polynomial, so use factor by grouping to complete the problem.

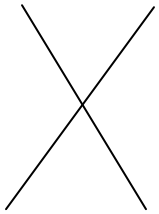
Directions: Factor each polynomial.

1. $2x^2 + 17x + 21$



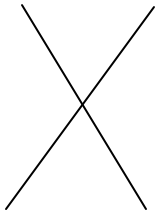
$(2x + 3)(x + 7)$

2. $2n^2 + 15n + 7$



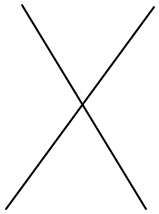
$(2n + 1)(n + 7)$

3. $m^2 + 6m - 27$



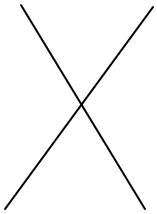
$(m - 3)(m + 9)$

4. $t^2 + 7t + 10$



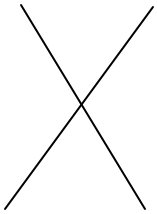
$(t + 5)(t + 2)$

5. $9k^2 - 11k + 2$



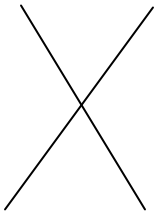
$(x - 1)(9x - 2)$

6. $y^2 - 13y + 36$



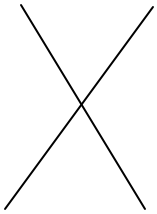
$(y - 9)(y - 4)$

7. $m^2 - 36$



$(m + 6)(m - 6)$

8. $8y^2 - 10y - 3$



$(2y - 3)(4y + 1)$

Practice Work:

Directions: Factor each polynomial. Show all of your work!

1. $n^2 - 2n - 63$ $(n-9)(n+7)$	2. $n^2 + n - 90$ $(n-9)(n+10)$
3. $x^2 + 8x - 9$ $(x+9)(x-1)$	4. $k^2 - 7k + 12$ $(k-3)(k-4)$
5. $x^2 - 4x - 45$ $(x-9)(x+5)$	6. $r^2 - 10r + 16$ $(r-2)(r-8)$

Multi-Step Factoring

Sometimes, you will have to use more than one factoring strategy to complete a problem. Most commonly, you will need to pull out a GCF first, then factor the trinomial.

Practice:

7. $5n^2 + 30n + 40$ $5(n+2)(n+4)$	8. $6p^2 - 60p + 150$ $6(p-5)(p-5)$
9. $-2n^2 - 6n - 4$ $-2(x+2)(x+1)$	10. $4r^2 + 52r + 160$ $4(r+5)(r+8)$
11. $5b^3 - 30b^2 + 45b$ $5b(b-3)(b-3)$	12. $4v^3 + 48n^2 + 108n$ $4n(n+3)(n+9)$

Due Date: _____ Name: _____ Pd: ____

Factoring Trinomials Homework

1. $k^2 + 18k + 81$ $(k + 9)(k + 9)$	2. $v^2 - 13v + 30$ $(v - 10)(v - 3)$
3. $v^2 + 12v + 32$ $(v + 4)(v + 8)$	4. $x^2 - x - 6$ $(x + 2)(x - 3)$
5. $v^2 + 14v + 48$ $(v + 6)(v + 8)$	6. $5r^2 - 11r - 12$ $(5r + 4)(r - 3)$
7. $2p^2 - 11v - 63$ $(2v + 7)(v - 9)$	8. $3v^2 - 5v - 28$ $(3v + 7)(v - 4)$
9. $7x^2 + 52x + 60$ $(7x + 10)(x + 6)$	10. $-3x^2 + 31x - 70$ $-(3x - 10)(x - 7)$

Factoring Trinomials Homework Page 2

This second parge is all multi-step factoring problems. Be sure to check for GCF first, then factor the remaining trinomial!

11. $20v^2 - 104v + 20$

$4(5v - 1)(v - 5)$

12. $25x^2 - 145x + 180$

$5(5x - 9)(x - 4)$

13. $18x^2 - 120x - 42$

$6(3x + 1)(x - 7)$

14. $9r^2 + 87r + 54$

$3(3r + 2)(r + 9)$

15. $-20b^2 + 136b + 192$

$-4(b + 6)(b - 8)$

16. $-25a^2 + 185a - 70$

$-5(5a - 2)(a - 7)$

17. $3v^2 + 11v + 8$

$(3v + 8)(v + 1)$

18. $9p^2 - 39p - 30$

$3(3p + 2)(p - 5)$

19. $2x^2 + 25x + 63$

$(2x + 7)(x + 9)$

20. $-5k^2 + 48k + 20$

$-(5k + 2)(k - 10)$

Thank you for purchasing this product!

Don't forget to go back to my store and leave feedback to receive TpT credits towards all your future purchases!

http://www.teacherspayteachers.com/Store/Fun-Wth-Algebra

Credits:

Font: KG Feeling 22 provided by KG Fonts
(TpT store:
https://www.teacherspayteachers.com/Store/Kimberly-Geswein-Fonts)

Borders: provided by The 3AM Teacher
(Website: http://the3amteacher.blogspot.com/)