

3.1

Factoring using GCF and Grouping

SCORE:

/

2023-2024

Name _____ Date _____ Period _____

Review.

a) $(x - 6)(x + 3)$

b) $(2x - 5)^2$

c) $(x + 4)(x - 4)$

Factoring using GCF: Steps

Factor $-4n^2 - 20$	
<ul style="list-style-type: none"> Find the GCF. 	$-4n^2 - 20$
<ul style="list-style-type: none"> Write the GCF outside a set of parentheses. Inside the parentheses, write what you are left with when you <i>divide</i> the original terms by the GCF. 	$-4(\quad)$ $-4\left(-\frac{4n^2}{-4} - \frac{20}{-4}\right)$ $-4(n^2 + 5)$
<ul style="list-style-type: none"> <u>When the leading coefficient is negative, factor out a common factor with a negative coefficient.</u> 	

Examples: Factor the following expressions.

1. $20x + 32$

2. $-18u^4 + 12$

3. $9k^2 - 3k$

4. $8r^3 - 36r^2 + 4r$

5. $2y^3z - 8y^2z + 5yz^2 + 10yz^3$

6. $-4t^3v - 10t^2v^5$

Factoring by Grouping (Used when you have 4 terms): Steps

Factor $18x^3 + 15x^2 + 24x + 20$	
1. Factor out the GCF from all four terms first (if there is one).	-----
2. Group into 2 parts	<u>$18x^3 + 15x^2$</u> + <u>$24x + 20$</u>
3. Factor out the GCF from each group	$3x^2(6x + 5) + 4(6x + 5)$
4. Hopefully the “leftover” pieces of each group are the same (If not, go back through and find your mistake). Factor the matching binomial out of the expression.	$(6x + 5)(3x^2 + 4)$

Factor each polynomial by grouping. Don't forget to factor out the GCF first, if necessary.

7. $g^3 - 3g^2 - 5g + 15$

8. $5a^3 + 2a^2 + 15a + 6$

9. $6xy - 36x - 5y + 30$

10. $2h^3 - 5h^2 + 8h - 20$

11. $42xy - 36x^2 + 21y - 18x$

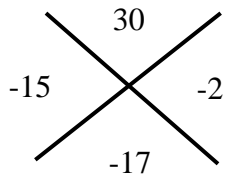
12. $3x^2 + 3x - 5xy - 5y$

To get ready for factoring trinomials

Standard form of a quadratic equation: $ax^2 + bx + c = y$

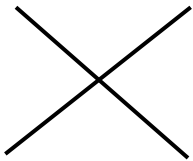
Use the numbers that are in the spots for a , b , and c . Multiply a and c . Then find the factors (numbers that multiply to $a \cdot c$) that add to b .

Example: $y = 5x^2 - 17x + 6$ Use $a = 5$, $b = -17$, and $c = 6$. $ac = 30$ What are the factors of 30 that add to -17 ? The numbers are -15 and -2 .

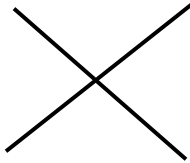


For the following questions, Find the factors of ac , that add to b .

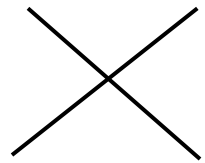
13. $y = 4x^2 - 5x - 6$



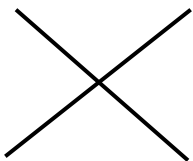
14. $y = 5x^2 + 6x - 8$



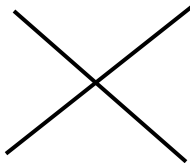
15. $y = 6x^2 + 19x + 10$



16. $y = 4x^2 - 9x - 9$



17. $y = 7x^2 + 22x + 3$



18. $y = x^2 + 3x - 10$

