

Factoring Trinomials ($ax^2 + bx + c$)

What does it really mean to **factor a trinomial? It means to write it as the product of two binomials

How to Factor a Trinomial in the Form $ax^2 + bx + c$

Step 1: Factor out a GCF if one exists

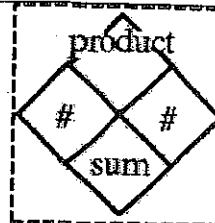
Step 2: Multiply your first term (a) and your last term (c)

Step 3: Set up your **X-Factor** (what multiplies to "ac" that adds to "b")

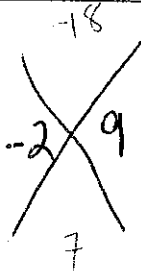
Step 4: Set up two quantities such that $(ax + _)(ax + _)$

Step 5: Divide by a common factor if one exists to simplify the quantity!

Step 6: FOIL to check work! (Don't forget your GCF in front!)



1. $3x^2 + 7x - 6$
 $(3x-2)(3x+9)$
 $(3x-2)(x+3)$



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

$(x-4)^2$

3. $3x^2 + 8x + 5$

$(x+1)(3x+5)$

$a=3$
 $b=8$
 $c=5$

4. $x^2 - 12x + 20$

$(x-10)(x-2)$

5. $7d^2 - 26d - 8$

$(d-4)(7d+2)$

6. $x^2 + 12x + 11$ $(3x+3)(3x+11)$

$(x+11)(x+1)$

7. $6t^2 + 25t + 11$

$(3t+11)(2t+1)$

8. $c^2 + c - 20$

$(c-4)(c+5)$

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

$(x-2)(5x-1)$

10. $6x^2 + 23x + 7$

$(2x+7)(3x+1)$

11. $20x^2 + 80x + 35$

$5(2x+7)(2x+1)$

12. $x^2 + 12x + 36$

$(x+6)(x+6)$

$(x+6)^2$

13. $2x^2 + 11x + 14$

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

14. $x^2 - x - 6$

$(x-3)(x+2)$

15. $2x^2 - x - 15$

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

Factoring Special Cases

Perfect Squares
Subtraction!
Difference of Squares: $x^2 - y^2 = (x - y)(x + y)$ or $x^2 + 0xy - y^2$

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|---|--|
| <p>1. $x^2 - 16$
$(x - 4)(x + 4)$</p> <p>3. $81x^2 - 4$
$(9x - 2)(9x + 2)$</p> <p>5. $16x^2 - 121$
$(4x - 11)(4x + 11)$</p> | <p>2. $25 - x^2y^2$
$(5 - xy)(5 + xy)$ (5+xy)(5-xy)
25 - 5xy - x^2y
+ 5xy</p> <p>4. $4x^2 - 1$
$(2x - 1)(2x + 1)$</p> <p>6. $49x^2 - 36$
$(7x - 6)(7x + 6)$</p> |
|---|--|

Mixed Review: Factor out a GCF, and then apply a factor rule

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|---|--|
| <p>1. $24g^2 - 6$
$6(4g^2 - 1)$</p> <p>3. $12x^2 + 12x + 3$
$3(4x^2 + 4x + 1)$
$3(4x - 2)(4x - 2)$</p> <p>5. $100x^2 - 81y^2$ Diff of square
$(10x + 9)(10x - 9)$ or $3(2x - 1)^2$</p> <p>7. $x^2 - 12x + 36$ GCF = 1
$(x - 6)(x - 6) = (x - 6)^2$ 36
-6 6
12</p> <p>9. $4x^2 + 24x + 36$
$(4x + 12)(4x + 12)$
$(x + 3)(x + 3)$
$4(x + 3)^2$ 144
12 12
24</p> <p>11. $16m^2 - 72m + 81$
$(4x + 9)^2$ 1,296
-72</p> <p><i>table gives you factors</i></p> | <p>2. $\frac{12t^2 - 48}{12}$
$12(t^2 - 4)$ * Diff of square
$12(t - 2)(t + 2)$</p> <p>4. $5x^2 + 13x + 30$
cant factor 150
13</p> <p>6. $2x^2 + 12x + 10$
$2(x^2 + 6x + 5)$
$2(x + 3)(x + 2)$ 5 2
3</p> <p>8. $4x^2 + 20x + 25$
$(4x + 10)(4x + 10)$
$(2x + 5)(2x + 5)$ 100
10 10
20</p> <p>10. $x^2 - 14x + 49$ GCF = 1 $\Rightarrow (2x + 5)^2$
$(x - 7)(x - 7)$
$(x - 7)^2$ 49
-7 -7
14</p> <p>12. $81r^2 - 90r + 25$
$(81x - 45)(81x - 45)$
$(9x - 5)^2$ 2025
-45 -45
-90</p> |
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