

Math 10 - Polynomials

Expanding

eg. $(x-4)(x^2+x+5)$
 $= x^3 + x^2 + 5x - 4x^2 - 4x - 20$
 $= x^3 - 3x^2 + x - 20$

eg. $(x+2)^2 \neq x^2+4$;
 $(x+2)(x+2) = x^2 + 2x + 2x + 4$
 $= x^2 + 4x + 4$

eg. $(x-1)^3$
 $(x-1)(x-1)(x-1)$
 $(x^2-2x+1)(x-1)$ etc...

Factoring (4 types)

1) GCF eg. $25xyz - 15xy^2$
 $5xy(5z - 3y)$

2) Difference of Squares $a^2 - b^2 = (a+b)(a-b)$
 eg. $25x^2 - 36y^2$
 $(5x+6y)(5x-6y)$

eg. $x^4 - 1$
 $(x^2+1)(x^2-1)$
 $(x^2+1)(x+1)(x-1)$ ✓

3) Simple trinomial (a=1)

eg. $x^2 + 6x + 8$
 $(x+2)(x+4)$

eg. $x^2 - 3x - 28$
 $(x-7)(x+4)$ add -3
 mult -28

eg. $x^2 + 2x - 80$
 $(x-8)(x+10)$ 10 - 8 mult 2

eg. $x^2 + 10x + 24$
 $(x+4)(x+6)$
 $(x-8)(x+10)$
 $x^2 + 10x - 8x + 80$
 $x^2 + 2x + 80$

4. Decomposition (when a ≠ 1) ie. $3x^2 \dots$

eg. $5x^2 - 12x + 4$

i) $5x^2 - 12x + 4$

ii) mult to 20, add to -12
 2 #s: -10 -2

iii) $5x^2 - 10x - 2x + 4$

iv) $5x^2 - 10x - 2x + 4$
 $5x(x-2) - 2(x-2)$

Final Answer: $(5x-2)(x-2)$

Steps

- i) Multiply A and C
- ii) Find 2 #s that multiply to AC and add to B
- iii) Break the middle term into those two #s.
- iv) Group 1st and last two

Put it all together

eg. $2x^4 - 9x^2 + 4$
 2 #s: -1, -8

100% quiz

eg. $7x^2 - 13x - 2$

Finest special

eg. $34x^4 + 2x^2 - 6$

$2x^4 - 8x^2 - x^2 + 4$

$2x^2(x^2-4) - 1(x^2-4)$

$(2x^2-1)(x^2-4)$ ← $a^2 - b^2 = (a+b)(a-b)$

$(2x^2-1)(x+2)(x-2)$