

factoring trinomials







(5x + 2)(5x + 2)



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First Outer Inner Last

Example. $25x^2 + 20x + 4$

- possible factors of $25x^2$ are $\{x,25x\}$ or $\{5x,5x\}$ and possible factors of 4 are $\{1,4\}$ or $\{2,2\}$
- try each pair of factors until we find a combination that works (or exhausts all possible pairs)
- ullet look for a combination that gives sum of the products of the outside terms and the inside terms equal to 20x

Factors of $25x^2$	Factors of 4	Resulting Binomials	Product of Outside Terms	Product of Inside Terms	Sum of Products
$\{x,25x\}$	{1, 4}	(x+1)(25x+4) (x+4)(25x+1)	4x x	25x $100x$	29 <i>x</i> 101 <i>x</i>
$\{x,25x\}$	{2, 2}	(x+2)(25x+2)	2x	50 <i>x</i>	52x
$\{5x,5x\}$	{2, 2}	(5x+2)(5x+2)	10x	10 <i>x</i>	(20x)

- Answer: (5x + 2)(5x + 2) (check via FOIL)
- Exercise 2. Factor the polynomial $21x^2 41x + 10$

solving quadratic equations by factoring