

Name NOTES

Section 3.3

Algebra II: Factoring Trinomials—Two sums

Essential Questions:

How do I factor a trinomial into two binomials?

Multiply the Binomials.

- $(x+2)(x+3)$ The first term times the first term is x^2 .
- $(x+2)(x+3)$ The first times the second term is $x^2 + 3x$.
- $(x+2)(x+3)$ The second term times the first term is $x^2 + 3x + 2x$.
- AND the second term times the second term is $x^2 + 3x + 2x + 6$.
- After you combine like terms, your final answer is $x^2 + 5x + 6$.

NEW NOTES

Now reverse the process to find the factors. $(x^2 + 5x + 6)$

- $(x^2 + 5x + 6) = (\quad) (\quad)$ Draw the parenthesis
- $(x^2 + 5x + 6) = (x \quad) (x \quad)$ The first terms must give you x^2 .
- $(x^2 + 5x + 6) = (x \quad ?) (x \quad ?)$

Find what **two numbers MULTIPLY** to give you 6 and **ADD** to give you 5.

$$(x+2)(x+3) = (x^2 + 5x + 6)$$

Factor Example 1 $x^2 + 7x + 10$

- Step 1 $(x \quad)(x \quad)$
- Step 2 What adds to get 7 = $2 + 5$
- Step 3 What multiplies to get 10 = 2×5
- Step 4 $(x+2)(x+5)$

- Check $(x+2)(x+5)$
 $x^2 + 5x + 2x + 10$
 $x^2 + 7x + 10$

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Factor Example 2 $x^2 + 10x + 16$

- Step 1 $(x \quad x \quad)$
- Step 2 What adds to get 10 = $2 + 8$
- Step 3 What multiplies to get 16 = 2×8
- Step 4 $(x+2)(x+8)$
- Check $x^2 + 8x + 2x + 16$
 $x^2 + 10x + 16$

Class Practice

Name all possible pairs of factors. (make a factor tree)

$\frac{10}{1+10}$	$\frac{7}{1+7}$	$\frac{9}{1+9}$	$\frac{6}{1+6}$	$\frac{4}{1+4}$	$\frac{20}{1+20}$	$\frac{12}{1+12}$	$\frac{16}{1+16}$
$2+5$		$3+3$	$2+3$		$2+10$	$2+6$	$2+8$
					$4+5$	$3+4$	$4+4$
	$\frac{21}{1+21}$	$\frac{25}{1+25}$	$\frac{30}{1+30}$				
	$3+7$	$5+5$	$2+15$				
			$3+10$				
			$5+6$				

Factor.

$$x^2 + 8x + 7$$

$$(x+1)(x+7)$$

$$x^2 + 13x + 30$$

$$(x+10)(x+3)$$

$$r^2 + 11r + 30$$

$$(r+5)(r+6)$$

If you multiply to get this:	And add to get this:	Then the two numbers are:
9	6	3 and 3
18	11	2 and 9
24	10	4 and 6

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Factoring trinomials—two sums.

Complete

If you multiply to get this:	And add to get this:	Then the two numbers are:
1) 18	11	
2) 5	6	
3) 6	5	
4) 8	6	
5) 12	8	
6) 12	7	
7) 9	6	
8) 15	8	
9) 14	9	
10) 18	9	
11) 20	9	
12) 21	10	
13) 24	14	
14) 24	11	
15) 36	12	
16) 36	13	

Factor

$$17) x^2 + 8x + 7 = (x + \quad)(x + \quad)$$

$$18) x^2 + 9x + 20 = (x + \quad)(x + \quad)$$

$$19) n^2 + 7n + 6 = (n + \quad)(n + \quad)$$

$$20) r^2 + 10r + 21 = (r + \quad)(r + \quad)$$

Factor and check by multiplication.

$$21) y^2 + 3y + 2$$

$$22) a^2 + 17a + 16$$

$$23) y^2 + 12y + 35$$

$$24) x^2 + 9x + 14$$

$$25) x^2 + 12x + 32$$