

Intro to College Math: Chapter 6.3  
Factoring More Trinomials

1. Factor the following trinomial.  $3a^2 + 17a + 10$

$3a^2 + 17a + 10$   
 $(a+2)(a+15)$

$3 \cdot 10 = 30$   
 $30$   
 $\swarrow \searrow$   
 $1 \cdot 30$   
 $2 \cdot 15$  (circled)  
 $3 \cdot 10$

*which ones add or subtract to make middle number?*

$2 + 15 = 17$  (circled)  
 $-2 + 15 = 13$   
 $2 - 15 = -13$   
 $-2 - 15 = -17$

*signs*

$(a+2)(a+15)$   
 $\frac{3}{3}$

*Divide by number that was in front of  $a^2$ .*

$(3a+2)(a+5)$  (boxed)  
*If divides evenly, then divide + write answer in ( )*

*If doesn't divide evenly, then move the denominator back in front of variable in that set of ( ).*

To factor:

- \* If you can not factor out anything, and you still have a number at the beginning of your problem.
- \* Make two set of ( ) ( ), and place the variable in each one.
- \* Then multiply the first number in the problem by the last number in the problem, and write the answer to the side.
- \* Then list all the possible sets of numbers that can multiply together to get that number.
- \* Then determine which set of numbers can add or subtract to get the middle number, and write these numbers in each set of ( ).
- \* Then determine the sign.
- \* Next, divide each number that you placed in the ( ) by the 1st number in your original problem.
- \* If the number divides evenly, then divide it and write down the number in the ( ).
- \* If the number does not divide evenly, then move the denominator back in front of the variable in that set of ( ).

2. Factor the following trinomial.  $2x^2 + x - 1$

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

$2 \cdot 1 = 2$   
 $2$   
 $\swarrow \searrow$   
 $1 \cdot 2$  (circled)

$1 + 2 = 3$   
 $-1 + 2 = 1$  (circled)  
 $1 - 2 = -1$   
 $-1 - 2 = -3$

*signs*

$(x-1)(x+2)$   
 $\frac{2}{2}$

$(2x-1)(x+1)$  (boxed)  
*Divide each by the 1st number in problem.*

*Since doesn't divide evenly, put back at front.*

3. Factor the following trinomial.  $6r^2 + 17r + 12$

$$6r^2 + 17r + 12$$

$$(r+8)(r+9)$$

$6 \cdot 12$   
 $72$   
 $\wedge$   
 $1 \cdot 72$   
 $2 \cdot 36$   
 $3 \cdot 24$   
 $4 \cdot 18$   
 $6 \cdot 12$   
 $8 \cdot 9$

$8+9=17$   
 $-8+9=1$   
 $8-9=-1$   
 $-8-9=-17$

$$(r+8)(r+9)$$

$\frac{6}{6} \quad \frac{6}{6}$  ← Divide / simplify

$$(r+\frac{4}{3})(r+\frac{3}{2})$$

$$(3r+4)(2r+3)$$

To factor:

- \* If you can not factor out anything, and you still have a number at the beginning of your problem.
- \* Make two set of ( ) ( ), and place the variable in each one.
- \* Then multiply the first number in the problem by the last number in the problem, and write the answer to the side.
- \* Then list all the possible sets of numbers that can multiply together to get that number.
- \* Then determine which set of numbers can add or subtract to get the middle number, and write these numbers in each set of ( ).
- \* Then determine the sign.
- \* Next, divide each number that you placed in the ( ) by the 1st number in your original problem.
- \* If the number divides evenly, then divide it and write down the number in the ( ).
- \* If the number does not divide evenly, then move the denominator back in front of the variable in that set of ( ).

4. Factor the following trinomial.  $-2r^2 - 11r - 15$

\* factor out what's in common

$$-2r^2 - 11r - 15$$

$$-(2r^2 + 11r + 15)$$

$$-(r+5)(r+3)$$

$2 \cdot 15$   
 $30$   
 $\wedge$   
 $1 \cdot 30$   
 $2 \cdot 15$   
 $3 \cdot 10$   
 $5 \cdot 6$

$5+6=11$   
 $-5+6=1$   
 $5-6=-1$   
 $-5-6=-11$

$$-(r+\frac{5}{2})(r+\frac{3}{2})$$

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

\* First, factor out what's in common. Here it is  $-$ .