

Factoring Trinomials

When factoring a trinomial you will use a method called reverse FOIL. Let's look at an example to find out how to do this.

Example #1 Factor $x^2 + 4x + 3$

Anytime we factor a trinomial (remember that was something that had 3 terms) we're going to start by creating two parenthesis $\rightarrow (\quad) (\quad)$

Next, we look at the first term. In this case it's x^2 . Therefore in the first spot of each parenthesis we're going to put an x. (Because $x \cdot x = x^2$) $\rightarrow (x \quad) (x \quad)$

Now we need to figure out what to put into the second spots of each parenthesis. To do this we look at the factors of the third term from our example. I find it helpful to write out the factors so I can see all the possible combinations. *Write them out!*

In this case it is 3. (This makes life easy for us! It won't always be that easy!)

What are the factors of the number 3? 1 and 3

Put them into the second spots of each parenthesis. $\rightarrow (x \quad 1)(x \quad 3)$

Here comes the hardest part. We need to decide what the signs (+ or -) should be in order to get to the middle term of $4x$. So you need to be thinking in your head if I re-multiplied this out and I FOILED, what should the signs be so that I get $4x$.

In this case we need them to both be + signs in order to get to $4x$.

Answer: $(x + 1)(x + 3)$

*** *Hint:* You can always check to see if your answer is correct by FOILING your answer and seeing if you get back to what the original problem was. ***

Practice Problem #1 Factor $x^2 + 3x - 10$ $\begin{matrix} -1, 10 \\ 2, 5 \end{matrix}$

$$\begin{matrix} (x \quad) (x \quad) \\ (x \quad 2) (x \quad 5) \end{matrix} \rightarrow (x - 2)(x + 5)$$

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Mr. Ward Answer Key

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$$20. \quad x^2 + 12x + 11 \quad \begin{array}{l} -1, 11 \\ 2, 14 \\ 4, 7 \end{array}$$

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

$$21. \quad x^2 + 16x + 28 \quad \begin{array}{l} -1, 28 \\ 2, 14 \\ 4, 7 \end{array}$$

$$(x+2)(x+14)$$

$$22. \quad x^2 + 15x + 36 \quad \begin{array}{l} -1, 36 \\ 2, 18 \\ 4, 9 \\ 12, 3 \end{array}$$

$$(x+12)(x+3)$$

$$23. \quad x^2 - 6x + 5 \quad \begin{array}{l} -1, 5 \\ 2, 6 \\ 4, 3 \end{array}$$

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

$$24. \quad x^2 - 9x + 18 \quad \begin{array}{l} -1, 18 \\ 2, 9 \\ 6, 3 \end{array}$$

$$(x-6)(x-3)$$

$$25. \quad x^2 - 12x + 32 \quad \begin{array}{l} -1, 32 \\ 2, 16 \\ 4, 8 \end{array}$$

$$(x-4)(x-8)$$

$$26. \quad x^2 + x - 12 \quad \begin{array}{l} -1, 12 \\ 2, 6 \\ 4, 3 \end{array}$$

$$(x+4)(x-3)$$

$$27. \quad x^2 + 4x - 21 \quad \begin{array}{l} -1, 21 \\ 2, 7 \\ 3, 7 \end{array}$$

$$(x+7)(x-3)$$

$$28. \quad x^2 + 9x - 36 \quad \begin{array}{l} -1, 36 \\ 2, 18 \\ 4, 9 \\ 12, 3 \end{array}$$

$$(x+12)(x-3)$$

$$29. \quad x^2 - 12x - 13 \quad \begin{array}{l} -1, 13 \\ 2, 12 \\ 4, 3 \end{array}$$

$$(x-13)(x+1)$$

$$30. \quad x^2 - 10x - 24 \quad \begin{array}{l} -1, 24 \\ 2, 12 \\ 4, 6 \\ 8, 3 \end{array}$$

$$(x-12)(x+2)$$

$$31. \quad x^2 - 2x - 35 \quad \begin{array}{l} -1, 35 \\ 2, 7 \\ 5, 7 \end{array}$$

$$(x-7)(x+5)$$

$$38. \quad x^2 + x - 20 \quad \begin{array}{l} -1, 20 \\ 2, 10 \\ 4, 5 \end{array}$$

$$(x+5)(x-4)$$

$$39. \quad x^2 - 11x + 18 \quad \begin{array}{l} -1, 18 \\ 2, 9 \\ 3, 6 \end{array}$$

$$(x-2)(x-9)$$

$$40. \quad x^2 - 4x - 21 \quad \begin{array}{l} -1, 21 \\ 2, 7 \\ 3, 7 \end{array}$$

$$(x-7)(x+3)$$

$$41. \quad x^2 + 10x + 9 \quad \begin{array}{l} -1, 9 \\ 2, 10 \\ 4, 5 \end{array}$$

$$(x+1)(x+9)$$

$$42. \quad x^2 - 12x + 32 \quad \begin{array}{l} -1, 32 \\ 2, 16 \\ 4, 8 \end{array}$$

$$(x-4)(x-8)$$

$$43. \quad x^2 + 13x + 42 \quad \begin{array}{l} -1, 42 \\ 2, 21 \\ 6, 7 \end{array}$$

$$(x+6)(x+7)$$

$$44. \quad x^2 - 7x + 12 \quad \begin{array}{l} -1, 12 \\ 2, 6 \\ 4, 3 \end{array}$$

$$(x-4)(x-3)$$

$$45. \quad x^2 + 11x + 18 \quad \begin{array}{l} -1, 18 \\ 2, 9 \\ 3, 6 \end{array}$$

$$(x+2)(x+9)$$

$$46. \quad x^2 - 6x - 27 \quad \begin{array}{l} -1, 27 \\ 2, 9 \\ 3, 9 \end{array}$$

$$(x-9)(x+3)$$

$$47. \quad x^2 + 5x - 24 \quad \begin{array}{l} -1, 24 \\ 2, 12 \\ 4, 6 \\ 3, 8 \end{array}$$

$$(x+8)(x-3)$$

$$48. \quad x^2 - 10x + 21 \quad \begin{array}{l} -1, 21 \\ 2, 7 \\ 3, 7 \end{array}$$

$$(x-3)(x-7)$$

$$49. \quad x^2 + 4x - 45 \quad \begin{array}{l} -1, 45 \\ 2, 9 \\ 5, 9 \end{array}$$

$$(x+9)(x-5)$$