

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #1 Factor the following trinomial:

$$\begin{array}{ccc} 2x^2 + 7x + 6 \\ \uparrow \quad \uparrow \quad \uparrow \\ a \quad b \quad c \end{array}$$

Steps:

1. Multiply $a \times c$.

$$2 \times 6 = 12$$

2. Find two numbers (N_1 and N_2) whose product is ($a \times c$) and whose sum is b .

$$3, 4$$

3. Rewrite the original trinomial, but when writing the middle term, replace bx with $N_1x + N_2x$.

$$2x^2 + 3x + 4x + 6$$

4. Factor by grouping (grouping the first two and the last two always works here).

$$\begin{aligned} & (2x^2 + 3x) + (4x + 6) \\ & x(2x + 3) + 2(2x + 3) \\ & \boxed{(x + 2)(2x + 3)} \end{aligned}$$

5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

$$\begin{aligned} & \overbrace{(x + 2)(2x + 3)} \\ & 2x^2 + 3x + 4x + 6 \\ & = 2x^2 + 7x + 6 \quad \checkmark \end{aligned}$$

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #2 Factor the following trinomial:

$$6x^2 - 11x - 10$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bx with $N_1x + N_2x$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #3 Factor the following trinomial:

$$3x^2 - 13x - 10$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bx with $N_1x + N_2x$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #4 Factor the following trinomial:

$$4d^2 - 12d + 9$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bd with $N_1d + N_2d$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #5 Factor the following trinomial:

$$-t^2 - t + 12$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bt with $N_1t + N_2t$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bxy + cy^2$

Problem #6 Factor the following trinomial:

$$5x^2 + 6xy + y^2$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bxy with $N_1xy + N_2xy$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bxy + cy^2$

Problem #7 Factor the following trinomial:

$$3m^2 - 13mn + 14n^2$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bmn with $N_1mn + N_2mn$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bxy + cy^2$

Problem #8 Factor the following trinomial:

$$-2x^2 + 5xy - 2y^2$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bxy with $N_1xy + N_2xy$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.

MTH-4106-1 Factoring Trinomials of the Form: $ax^2 + bx + c$

Problem #9 Factor the following trinomial:

$$x^2 - 6x - 27$$

Steps:

1. Multiply $a \times c$.
2. Find two numbers (N_1 and N_2) whose product is $(a \times c)$ and whose sum is b .
3. Rewrite the original trinomial, but when writing the middle term, replace bx with $N_1x + N_2x$.
4. Factor by grouping (grouping the first two and the last two always works here).
5. Don't forget to check your answer! The factors (your answer), when multiplied together, must give you the original trinomial.