

Factoring By Decomposition ~ Optional Grade 11 Math

Polynomials of the Form $ax^2 + bx + c$

Example #1: Factor the following trinomials by decomposition. Use the distributive property to check your answer.

$$\begin{aligned} \text{a) } & \overbrace{6h^2 + 11h + 4} \\ & = 6h^2 + 8h + 3h + 4 \\ & = 2h(3h + 4) + 1(3h + 4) \\ & = \boxed{(3h + 4)(2h + 1)} \end{aligned}$$

24	1
12	2
<u>8</u>	<u>3</u>
6	4

$$\begin{aligned} \text{b) } & \overbrace{3s^2 - 13s - 10} \\ & = 3s^2 - 15s + 2s - 10 \\ & = 3s(s - 5) + 2(s - 5) \\ & = \boxed{(s - 5)(3s + 2)} \end{aligned}$$

30	1
<u>-15</u>	<u>+2</u>
10	3
6	5

$$\begin{aligned} \text{c) } & 6x^2 - 21x + 9 \\ & = 3(2x^2 - 7x + 3) \\ & = 3(2x^2 - 6x - x + 3) \\ & = 3(2x(x - 3) - 1(x - 3)) \\ & = \boxed{3(x - 3)(2x - 1)} \end{aligned}$$

-6	-1
3	2