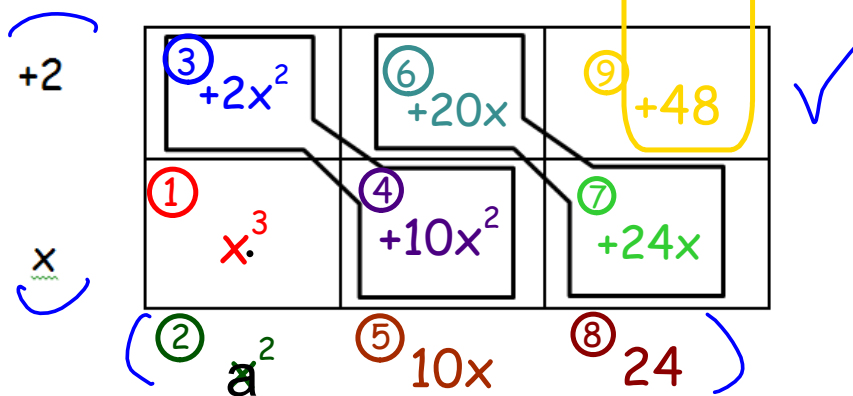


Standard form: $y = x^3 + 12x^2 + 44x + 48$
 if we know one factor is $(x+2)$. *Root at $(-2, 0)$
 Root at $x = -2$*



Partially factored form: $y = (x+2)(x^2+10x+24)$

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+4	+4x	+24
x	x ²	+6x
	x	+6

~~$$\begin{array}{cc} 24x^2 & \\ 6x & 4x \\ & 10x \end{array}$$~~

Fully factored form: $y = (x+2)(x+4)(x+6)$

* Factor $f(x) = 6x^3 - 5x^2 - 19x + 10$. Given $(3, 0)$ is **not** a root. \rightarrow factor $(x-3)$

-3	$-18x^2$	$-39x$	-60	$+70$	\leftarrow "the remainder"
x	$6x^3$	$+13x^2$	$20x$		

$6x^2 + 13x + 20$

Partially factored form: $(x-3)(6x^2+13x+20) + \underline{70}$

Check by evaluating $f(3)$: $6(3)^3 - 5(3)^2 - 19(3) + 10$
exponents first
 $= 6(27) - 5(9) - 19(3) + 10$
 $= 70$

The Remainder Theorem: The remainder when $f(x)$ is divided by $x - a$ is equal to $f(a)$.

Note: If $f(a) = 0$ then $x = a$ is a root of $f(x)$.