Ex. 2) Use direct substitution to evaluate $f(x) = 5x^3 + 4x^2 + 8x + 1$ when $x = 2$.

$5(2)^3 + 4(2)^2 + 8(2) + 1$

$5(8) + 4(4) + 16 + 1$

$40 + 16 + 17 = \boxed{73}$

Definition:

Synthetic Substitution – Another way to _____ a polynomial function is to use synthetic substitution. This method, show in the next example, involves _____ operations than direct substitution and has an extension into _____ polynomials, as you will see in Section 5.5.

Ex. 3) Use synthetic substitution to evaluate f(x) from example 2 when x = 2.

2	5	4	8	1
	↓	10	28	72
	5	14	36	73

Ex. 4) Use direct and synthetic substitution to evaluate $f(x) = 2x^4 - 5x^3 - 4x + 8$ when x = 3.