11/13/2023:

Polynomials

- constants $\quad x^0$
- lines $\quad x^1$
- quadratics $\quad x^2 \leftarrow$ deg 2
- cubic $\quad x^3 \leftarrow$ deg 3
- quartic $\quad x^4$
- quintic $\quad x^5$
- hextic $\quad x^6$

x^7

$\vdots$

$x^n \leftarrow$ a #

x

"degree"

$a \geq 0$

$\checkmark$

$$\left(2 \right) x^{2023} - \pi x^7 + 2$$

degree $= 2023$

BIGGEST exponent on x's

$n =$ degree

if n is even

both up or both down

if n is <u>odd</u>

one up
one down

$a < 0$
↑
"leading coefficient"

$a > 0$

$f(x) = 3x^{15} - 7x^{10} + 23$

<u>deg</u>
(15)

leading
coeff
(3)

$g(x) = -20x + 17x^2 - 1x^3$

3   -1

not a polynomial if

x in   ∘∘√

FAILURES • denominator

• in the exponent

$3 + \sqrt{x^3}$

$1/x$

2^x

not a poly

$x^2 + \sqrt{x^3}$ ← <u>not</u> a poly

$$f(x) = 2 + 3x^2 - 5x^4$$

$$g(x) = 1 - 2x^2 + x^3 - 10x^4$$

Find $f(x) + g(x)$

$$= \boxed{3 + 1x^2 + 1x^3 - 15x^4}$$

$\underline{f(x) - g(x)}$

$$2 + 3x^2 - 5x^4$$
$$- [1 - 2x^2 + x^3 - 10x^4]$$
$$\overline{}$$
$$1 + 5x^2 - 1x^3 + 5x^4$$