Polynomials

$$3x^2 - 8x^1 + 1x^0$$

$3x^2$: 1

#terms = 3

leading term = $3x^2$

leading Coefficient = 3

$+7 - 4x^2 + 5x^3 - 8x^4 - 2x$

$-8x^4 + 5x^3 - 4x^2 - 2x + 7$

leading coefficient $= -8$

degree $= 4$

Name Polynomials

By # terms

1- Monomials

2- binomials

3- trinomials

or

By degree (highest exponent)

1- $3x^1+2$ → linear

2 → $3x^2+4x-5$ → Quadratics

3 → $4x^3-2x+1$ → Cubic

4 → $5x^4+2x$ → Quartic

Arithmetic → Algebra

$32 + 59$

$$\begin{array}{r} {\scriptstyle 1} \\ 32 \\ +\ 59 \\ \hline 91 \end{array}$$

$$\begin{array}{r} \cancel{32} \\ \cancel{59} \\ \hline \end{array}$$

Base Ten Number System

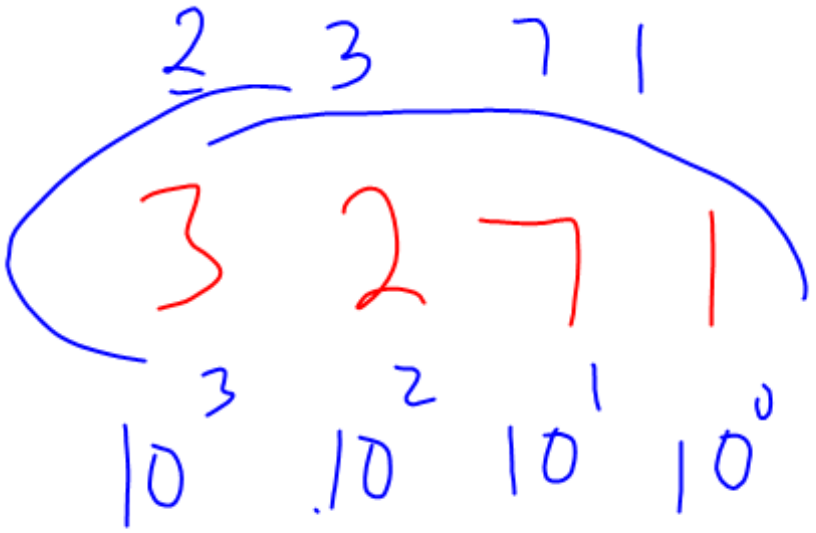
1. 10 digits 0-9
2. Place values are powers of Ten

thous hund tens ones

3271

$1000 \quad 100 \quad 10 \quad 1$

$10^3 \quad 10^2 \quad 10^1 \quad 10^0$



$3 \cdot 10^3 + 2 \cdot 10^2 + 7 \cdot 10^1 + 1 \times 1$

$3x^3 + 2 \cdot x^2 + 7 \cdot x^1 + 1x^0$

$3x^3 + 2x^2 + 7x + 1$

$$(3x^3 + 2x^2 - 8) + (2x^3 + 6x^2 + 5x - 2) \quad \begin{array}{r} 29 \\ +15 \\ \hline \end{array}$$

$$\begin{array}{r} 3x^3 + 2x^2 + 0x - 8 \\ 2x^3 + 6x^2 + 5x - 2 \\ \hline 5x^3 + 8x^2 + 5x - 10 \end{array}$$

Subtract $5x^2 - 8x - 2$ from $-3x^2 - 2x - 1$

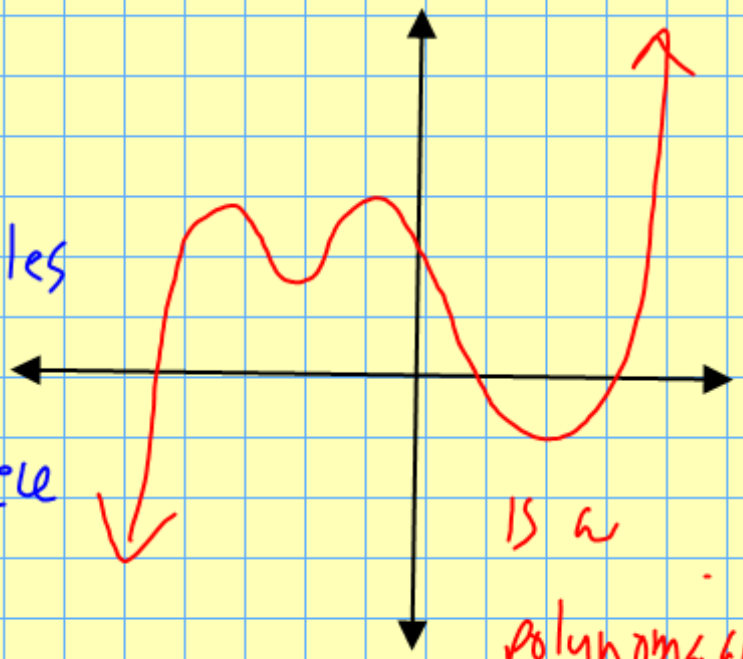
$$-3x^2 - 2x - 1 + (5x^2 + 8x + 2)$$

$$+(-5x^2 + 8x + 2)$$

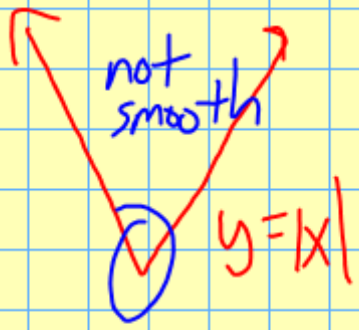
$$-8x^2 + 6x + 1$$

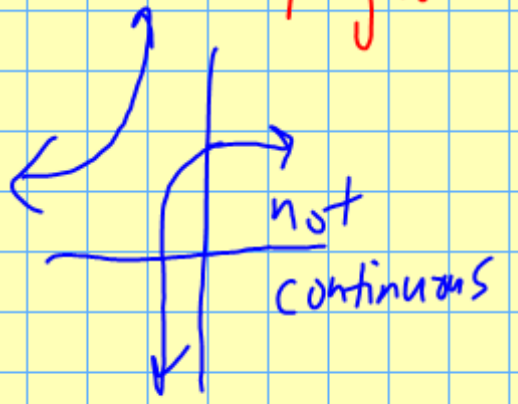
Graphing polynomials

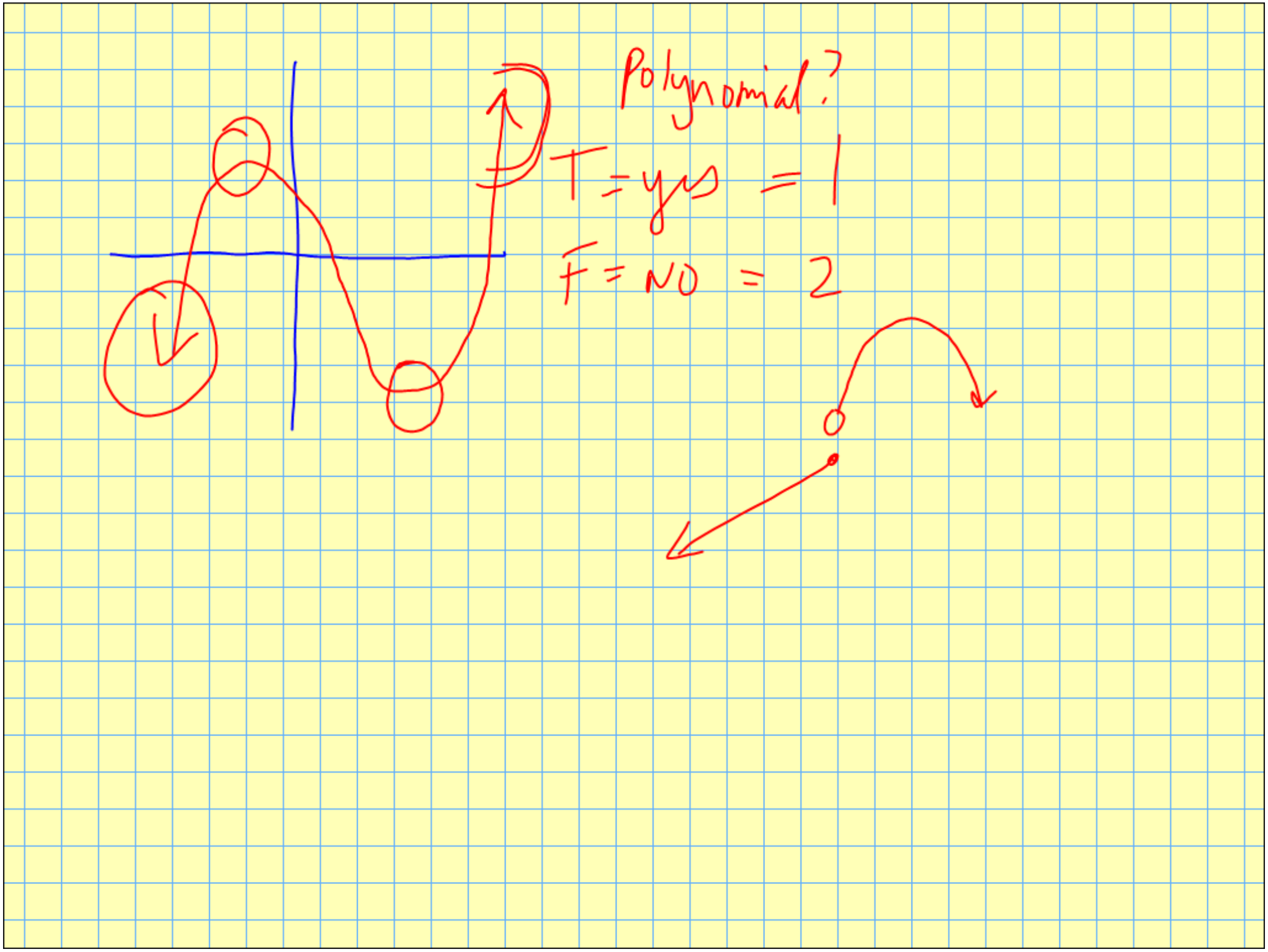
1. Smooth – no sharp angles
2. Continuous – only 1 piece



is a polynomial






Polynomial?
T = yes = 1
F = NO = 2

end behavior what happens as

$x \to$ and $x \leftarrow$

Which Graph is the graph of

$y = -3x^3 - 2x^2 + 1$ end behavior