Six Ways to Understand a Polynomial Function

One function. Six connected views. Every arrow runs both directions — each view can check any other.

1 Standard form

$m(x) = x^3 + 3x^2 - 4$

Shows the degree, the leading term, and the y-intercept.

2 Factored form

$m(x) = (x + 2)^2(x - 1)$

Shows every zero and how many times it repeats.

3 Zeros and multiplicity

$x = -2$, multiplicity 2

$x = 1$, multiplicity 1

Even multiplicity touches. Odd multiplicity crosses.

SAMPLE FUNCTION

$m(x) = (x + 2)^2(x - 1)$

$m(x) = x^3 + 3x^2 - 4$

Same function. Different evidence.

4 End behavior in words

Odd degree, positive leading coefficient.

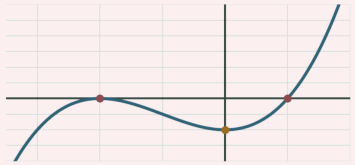
Left tail down; right tail up.

5 Table of values

x	-3	-2	0	1	2
$m(x)$	-4	0	-4	0	16

Pins the exact height and the scale.

6 Graph



Touches the axis at -2; crosses at 1.

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