

# Mathematics Class Slides

## Bronx Early College Academy

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## GQ: How do we factor polynomials?

CCSS: HSS.CP.B.6 Understand polynomial functions

11.2

Do Now: Given the function  $f(x) = (x - 2)(x + 1)(x + 3)$

1. What is the degree of the function?
2. What is the sign of its leading coefficient?
3. (hence, what is its end behavior?)
4. What is its constant term?
5. (hence, what is its y-intercept?)

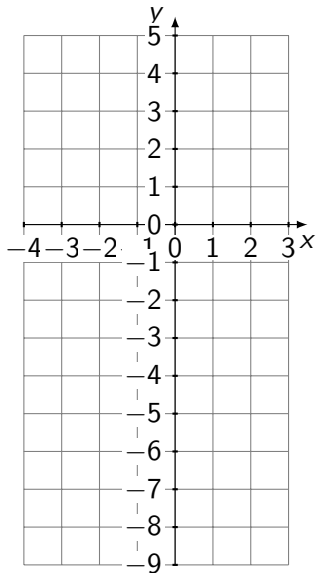
Lesson: Factors of a polynomial as solutions / x-intercepts p. 288

Task: Graph features of polynomials, problem set

Assessment: Graphing problem #3

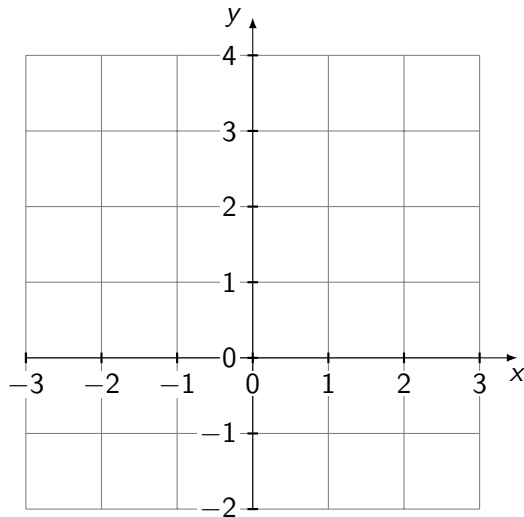
Homework: Handout

Graph  $f(x) = (x - 2)(x + 1)(x + 3)$



## Graphing polynomials

Graph the function  $f(x) = x^4 - 4x^2 + 3$



# Polynomials

Each polynomial function can be shown in two forms: standard and factored.

11.2

**Standard form:** From largest exponent to smallest

**Order or degree:** value of the largest exponent

**Constant term:** the ones value (8, in the example below)

**Factored form:** Product of binomials

**Factor:** each monomial (e.g. " $(x + 1)$ ")

1. Evaluate  $f(0)$  and  $f(2)$  for each function below.

2.  $f(x) = x^3 - 5x^2 + 2x + 8$

$$f(x) = (x + 1)(x - 2)(x - 4)$$

## Vocabulary for polynomial functions

Standard form, factored form, order, degree

substitution, long division, remainder

x-intercepts, zeros, roots, solutions

y-intercept

end behavior, increasing/decreasing, turning points

symmetry, odd/even

## Interpreting a displacement vs time graph

CCSS: F.IF.B.6 Calculate & interpret the rate of change of a function

Consider the function  $f(x) = -x^2 + 2x + 3$

1. Factor  $f$  and state its zeros.
2. Restate  $f$  in vertex form. Write down the vertex as an ordered pair.
3. Over what intervals is the function increasing, decreasing, and neither?
4. If  $f(x)$  represents the height of a diver over the domain  $0 \leq x \leq 3$ , interpret  $f(0)$ , the vertex, and  $f(3)$
5. What does the "slope" of the curve represent?