Topic 3.5: Dividing Polynomials

Essential Question:

How are the zeros of a polynomial function related to a function's equation and graph?

Model and Discuss

Remainder Theorem and Factor Theorem

Q: How do the Remainder Theorem and Factor Theorem Compare?

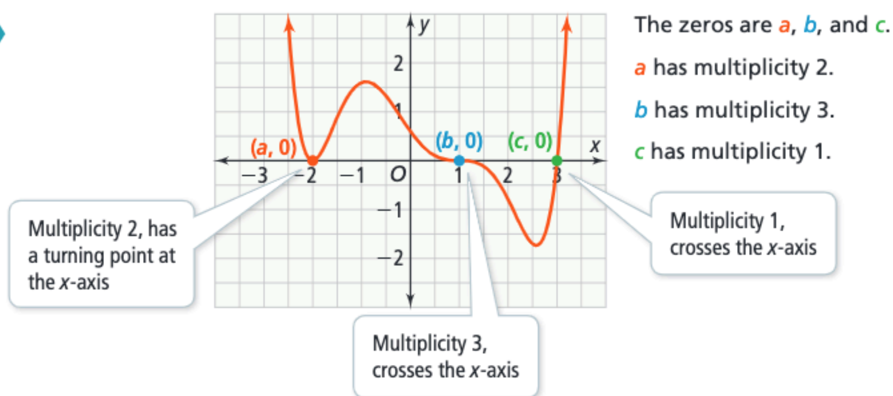
CONCEPT Summary

Q: How does the graph shown verify that *a, b,* and *c* are zeros of the function?

CONCEPT SUMMARY Zeros of Polynomials

FUNCTION $f(x) = (x - a)^2(x - b)^3(x - c)$

GRAPH



Notes:

Examples & Questions

Examples 1
Q: How is the Zero Product Property helpful when graphing a polynomial function?

Examples 2
Q: What do you notice about each graph in relation to the polynomial function it represents?

Q: How does the term *multiplicity of a zero* relate to multiplication?

Examples 3
Q: What do you notice about the graph that helps in determining the zeros of the function?

Q: Why is it helpful to use synthetic division to find a zero of a function?

Examples 4
Q: Why is it important to think about the domain of the function before starting?

Q: Why would only discrete values greater than 0 be in the domain of this function?

Q: What do the zeros represent in the context of the problem?

Examples 5
Q: How could you find the roots of *P(x)* if you didn't recognize the identity
$x^3 + 3x^2y + 3xy^2 + y^3 = (x+y)^3$?

Examples 6
Q: Why is the solution of the inequality the same as the intervals where the graph of *P(x)* is below the *x-asis*?

Practice and Problem Solving
Complete MathXL for School: Additional Practice (online)
Complete MathXL for School: Enrichment (online)

Challenge: #25, 27, 30 – key will be posted in Power School Learning.

Lesson Quiz 3.5