Chapter 15 review

Name: _____

$$Given:\ f(x) = \frac{x^3 - x^2 - 7x + 15}{x + 3}$$

1. What does this graph have? Where is it?

2. What kind? How do you know? What is the limit?

3. Write the numerator as a product of a linear factor and a quadratic.

4. Simplify. How could you graph this without a calculator?

5. What kind of zeros are remaining? How do you know? How can you find them?

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6. Find the instantaneous rate of change at x = 3:

   a. numerically

   b. algebraically

   c. graphically (rough sketch)

   d. Find the equation of the line tangent to the graph at $x = 3$.

7. Find the derivative using the general power rule. Then find $f'(4)$. What does this mean?

8. Use the derivative to find the extreme(s).