Assignment

Write

In your own words, explain how solving a polynomial inequality is similar to solving a linear inequality.

Remember

The solutions to a polynomial inequality are intervals of x-values that satisfy the inequality.

Practice

1. Emilio has been trying to regulate the pH level in his tropical fish aquarium for 5 hours. In order to make the water safe for his fish, Emilio must keep the pH level less than or equal to 9. The function $p(x) = -0.34x^3 + 2.652x^2 - 5.4638x + 11.1114$ represents the pH level in the tank x hours since Emilio began to regulate it.
   a. Write an inequality that represents the pH level in the tank being in the safe range.
   b. Solve the inequality and determine the time intervals during which the pH level in the tank safe for Emilio's fish.
2. Solve the inequality $2x^3 - 8x \leq 0$ by factoring and sketching. Use the given coordinate plane to sketch the general graph of the polynomial in order to determine which values satisfy the inequality. Label the axes.

Stretch

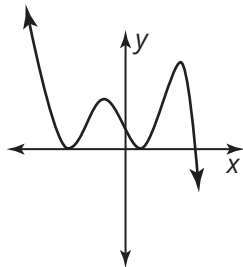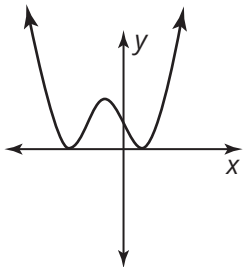Solve $x^5 - 4x^3 + x^2 - 4 \leq 0$.

Review

1. Completely factor each expression over the set of real numbers.

   a. $x^3 - 4x^2 - x + 4$

   b. $x^4 - 8x^2 - 9$

2. Describe the combination of real and imaginary zeros for each graphed function. Include the multiplicity of each real zero.

3. Describe the end behavior of each function.

   a. $f(x) = -x^4 - 4x^3 + 3x + 25$

   b. $g(x) = 2x^5 - 9x^3 + 5x^2 - 8x - 10$