

Purpose: In this problem set, you will be connecting factoring methods, properties of polynomials, and graphs of polynomials.

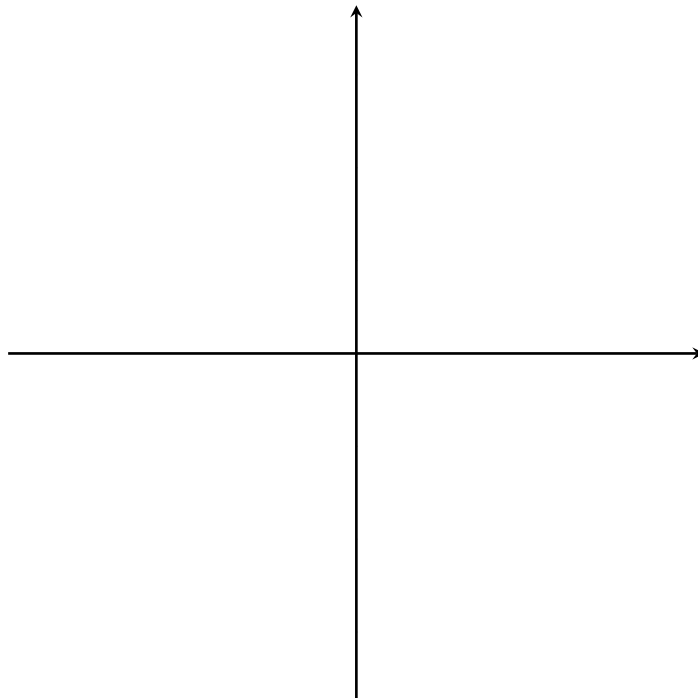
1. Consider the polynomial $g(x) = -(x + 3)(x + 2)(x + 1)$.

(a) What is the leading term?

(b) What is the end behavior?

(c) What are the zeros (including their multiplicities)?

(d) Sketch a graph of the polynomial. Remember that you must label all zeros and at least one point that is not a zero.



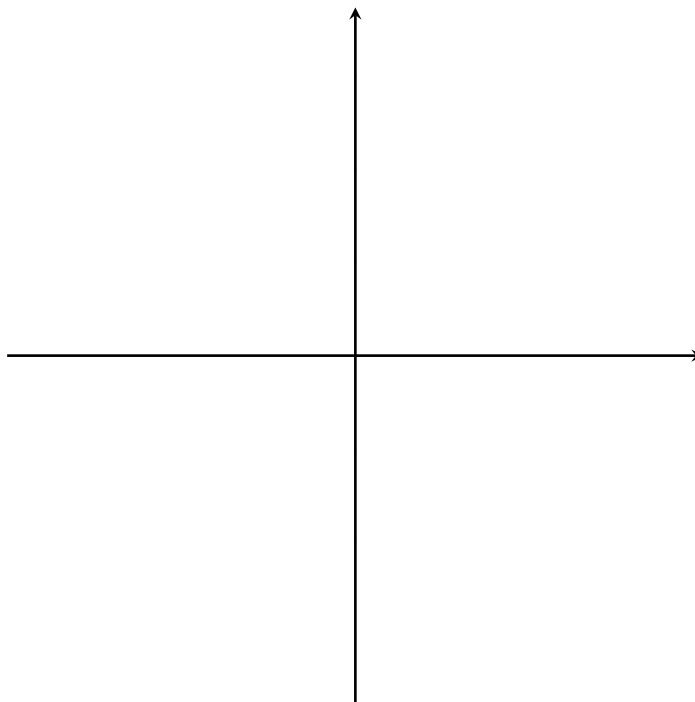
2. Consider the polynomial $h(x) = x^2 - x - 2$.

(a) What is the leading term?

(b) What is the end behavior?

(c) What are the zeros (include their multiplicities)?

(d) Sketch a graph of the polynomial. Remember that you must label all zeros and at least one point that is not a zero.



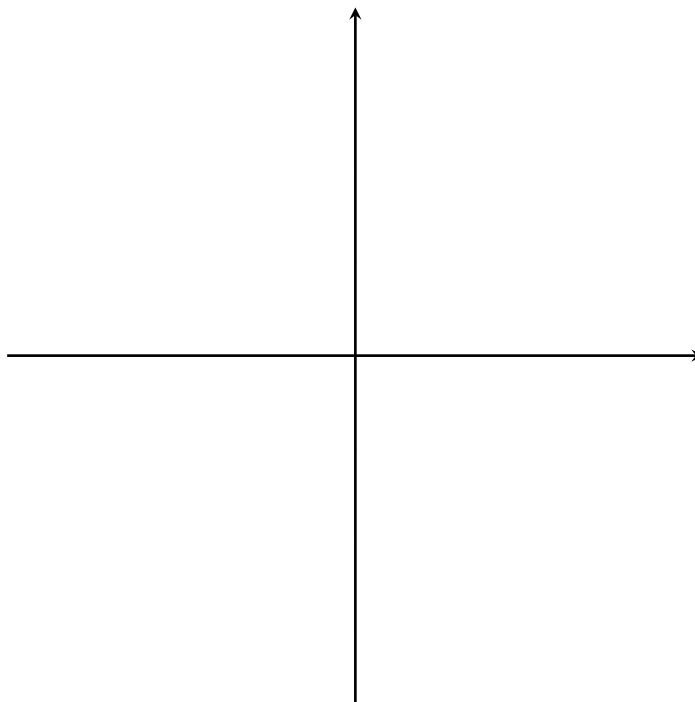
3. Consider the polynomial $f(x) = 2(x - 2)^2(x + 3)$.

(a) What is the leading term?

(b) What is the end behavior?

(c) What are the zeros (including their multiplicities)?

(d) Sketch a graph of the polynomial. Remember that you must label all zeros and at least one point that is not a zero.



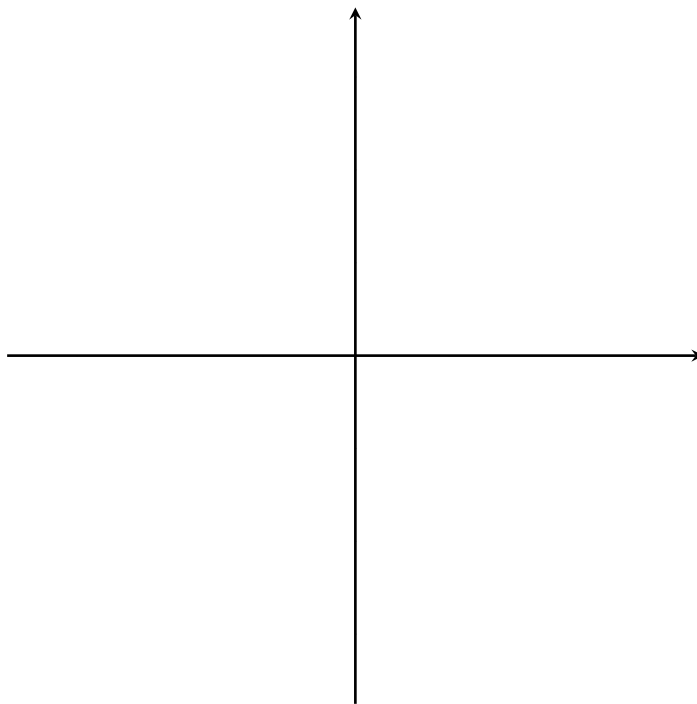
4. Consider the polynomial $p(x) = -3x^5 - 6x^4 - 3x^3$.

(a) What is the leading term?

(b) What is the end behavior?

(c) What are the zeros (including their multiplicities)?

(d) Sketch a graph of the polynomial. Remember that you must label all zeros and at least one point that is not a zero.



5. Find an equation for the polynomial with all of the following features:

- Degree 5
- Bouncing root at $x = -3$
- Wiggling root at $x = 1$
- y -intercept at $(0, -2)$

6. Find an equation for the polynomial with all of the following features:

- Degree 8
- Even root at $x = 0$
- Single root at $x = -4$
- Wiggling root at $x = 3$
- Through the point $(-2, -2)$