**Purpose:** In this problem set, you will be utilizing your skills with polynomials to build new polynomials with properties determined at random! Beware that not all rolls of the dice will be reasonable.

1. You need one double die and one signed die.

    (a) Roll one double die. Inside: _____ Outside: _____

    (b) Write a polynomial function with degree given by the outside die and zero given by the inside die.

    (c) Roll a signed number die: _____

    (d) Write a polynomial function with the same degree and zero determined above but with y-intercept given by your new die roll.

    (e) Graph the polynomial you found in part (d).
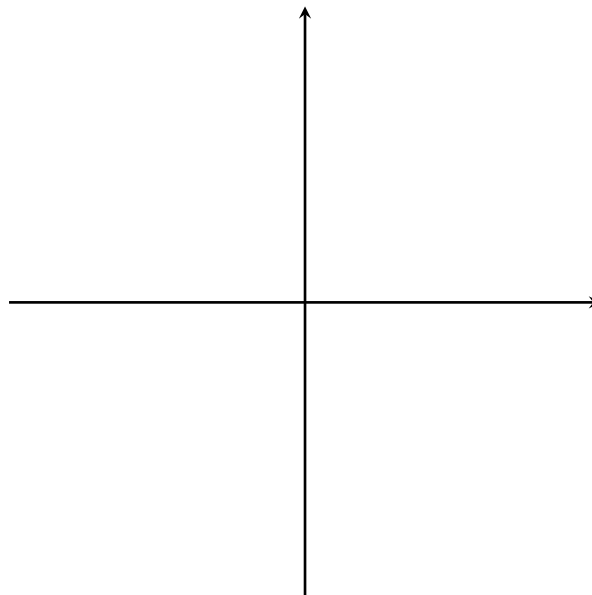
2. You need two double die and one signed die.

   (a) Roll two double dice.

   Inside 1: _____ Outside 1: _____

   Inside 2: _____ Outside 2: _____

   (b) Write a polynomial function with zeros given by the inside dice with multiplicities given by the outside dice. (So one inside/outside pair will give a zero and its multiplicity.)

   (c) Roll a signed number die: _____

   (d) Write a polynomial function with the same zeros and multiplicities given above but vertically stretched by the value of the new die roll.

   (e) Graph the polynomial you found in part (d).
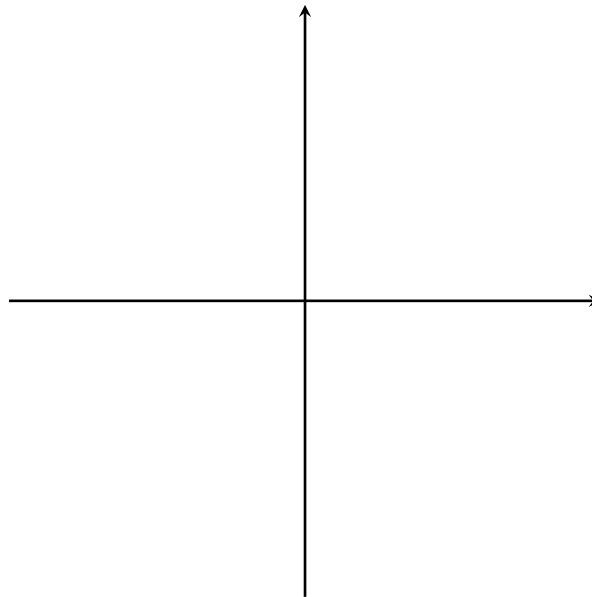
3. You need two triple dice and one regular die.

    (a) Roll two triple dice.

        Blue 1: _____ Red 1: _____ White 1: _____

        Blue 2: _____ Red 2: _____ White 2: _____

    (b) Write a polynomial function with zero at *color 1* of multiplicity *color 2*. (So the pair of the zero and the multiplicity share a color but may differ depending on the roll of the dice.)

    (c) Roll a single number die: _____

    (d) Write a polynomial function with the same zeros and multiplicities determined above but with y-intercept given by your new die roll.

    (e) Graph the polynomial you found in part (d).
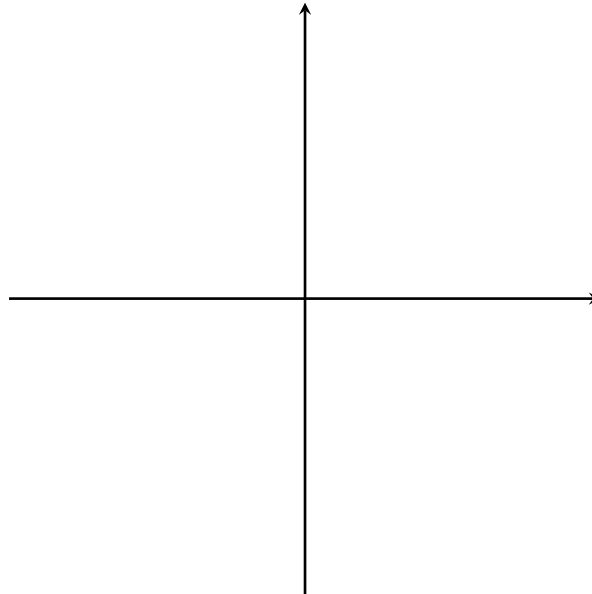
4. Write your own activity and trade with a partner!