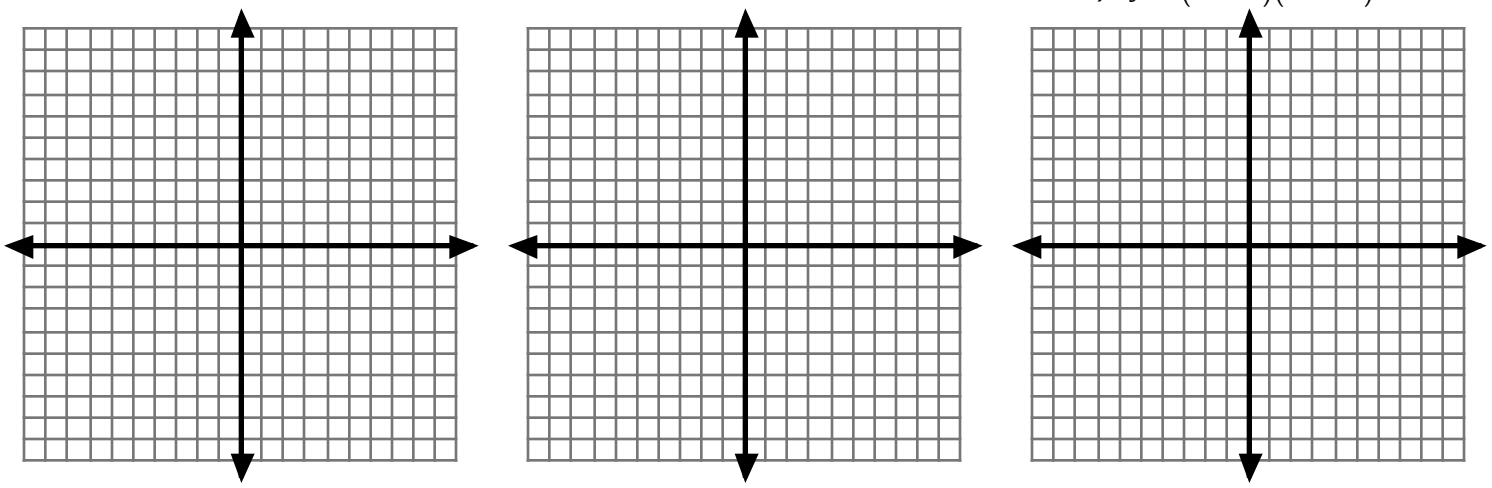
Advanced Algebra Polynomial Graphs NAME_____

Polynomial EQ's DATE _____ Per._____

(Press ZOOM - 6 to standardize your window, and then ZOOM - 5 to square it.)

1. Graph the following equations by pressing Y= and entering each expression. Then draw graph.

a) $y = (x-3)(x+1)$ b) $y = x(x-2)(x+3)$ c) $y = (x^2-1)(x^2-4)$



d) How many times does the quadratic polynomial cross the x-axis? The cubic? Quartic?

e) What are the x-intercepts in part a? Part b's graph? Part c?

f) Which graph has symmetry over the y-axis (i.e. an even function with $p(x) = p(-x)$)?

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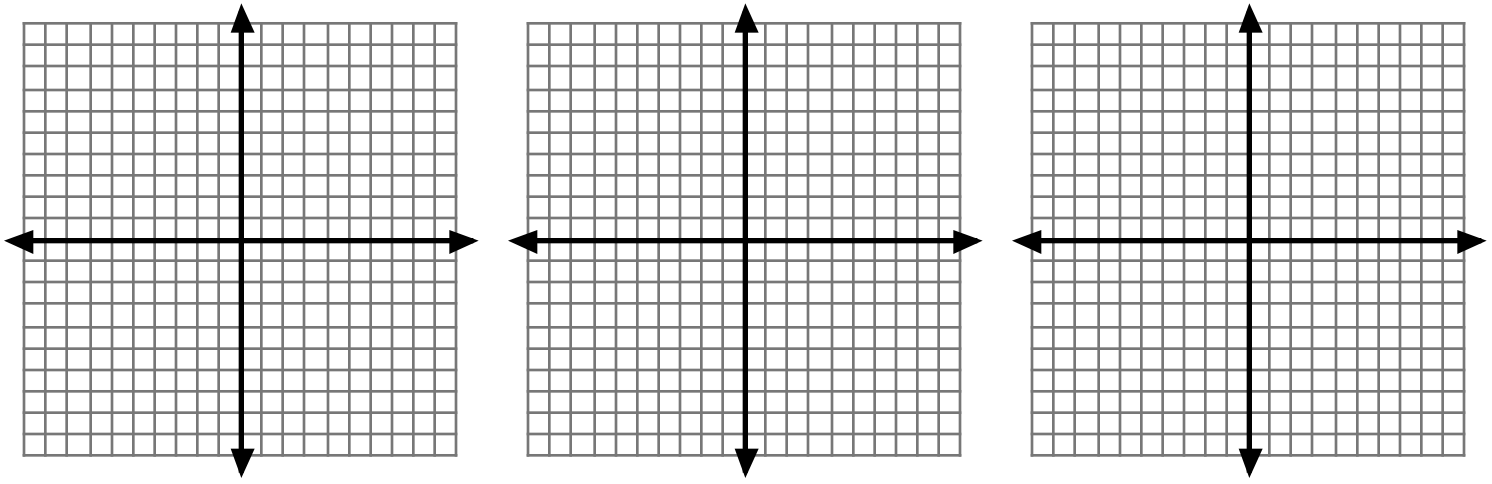
2. Graph the following equations. :

a) $y = (x-3)(x+1)^2$ b) $y = (x-1)^2(x+1)^2$ c) $y = x(x-2)^2(x+2)^2$



d) Where does each graph "bounce" off the x-axis?

e) How could you tell where it bounces from looking at the equation without graphing?

f) Each "bounce" matches a repeated factor with an exponent > 1. e.g. $(x-3)^2$ has a multiplicy of 2 at x = 3. Write an equation that has a multiplicity of 2 at x = 1.

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3. a) Write an equation of a polynomial that crosses the x-axis at (0,0), (0,1), (0, –1), (0, 2) and (0, –3)

b) Identify the multiplicities and x-intercepts of $y = (x-0)(x-1)^2(x+4)^3$.

c) Finish factoring to find all x-intercepts of $y = (x^2-1)(x^2-9)(x^2-x-6)$.
Are there any multiplicities?