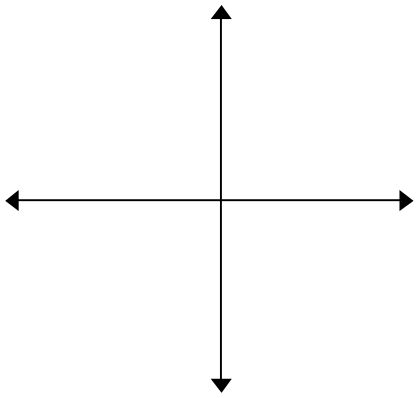
Algebra 2 Name:
Homework Date:

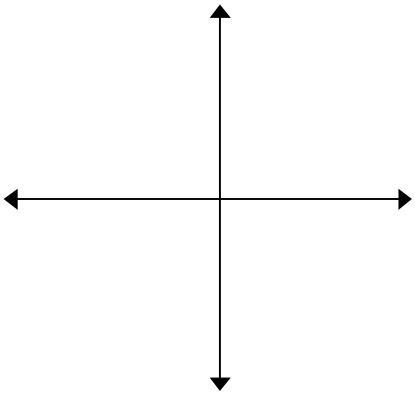
END BEHAVIOR

1. **Without** a graphing calculator, sketch the shape of the graph (concentrate on the end behavior) of the following functions.

a. $f(x) = 3x^4 - 7x^3 - 13$



b. $f(x) = -2x^3 + 3x^2 + 4x + 1$

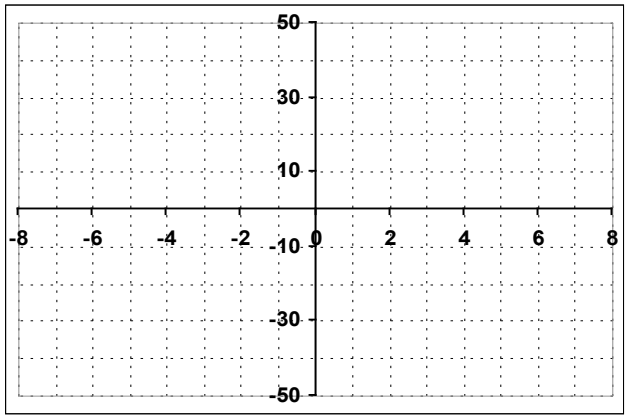


2. Describe the end behavior of the graphs of the following functions. You do NOT need to multiply out the ones that are factored—all that matters is the term with the highest power of x.

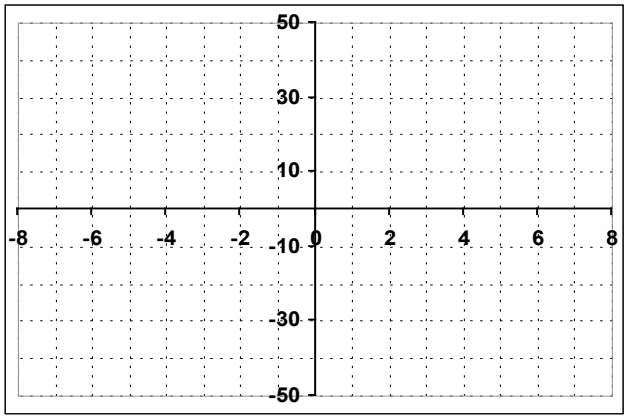
	as $x \to \infty$, $f(x) \to$	as $x \to -\infty$, $f(x) \to$
a. $f(x) = -2x^3 + 6x - 11$		
b. $f(x) = x^4 - 5x^3 - x^2 + 2x + 1$		
c. $f(x) = 2(x-1)(x+3)(x-5)$		
d. $f(x) = -x^2(x+7)(x-3)$		
e. $f(x) = 3x^2(x-1)^3(x+2)$		

3. **Without** a calculator, sketch a graph of each of the functions below. Plot the *x*- and *y*-intercepts and make sure that your end behavior is appropriate. **The *x*-scale is one unit; the *y*-scale is ten units.**

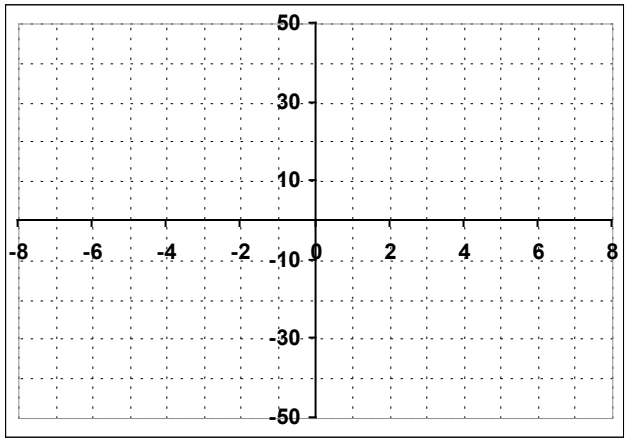
a. $f(x) = 2(x-5)(x+1)(x+4)$



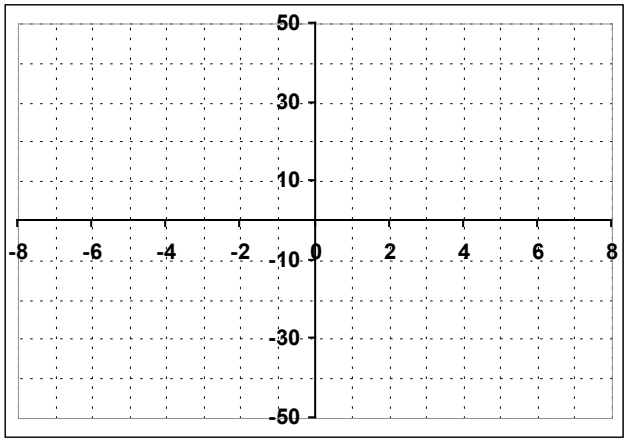
b. $f(x) = -0.5(x+6)(x+2)(x-5)(x-1)$



c. $f(x) = -3x(x-2)(x+6)$

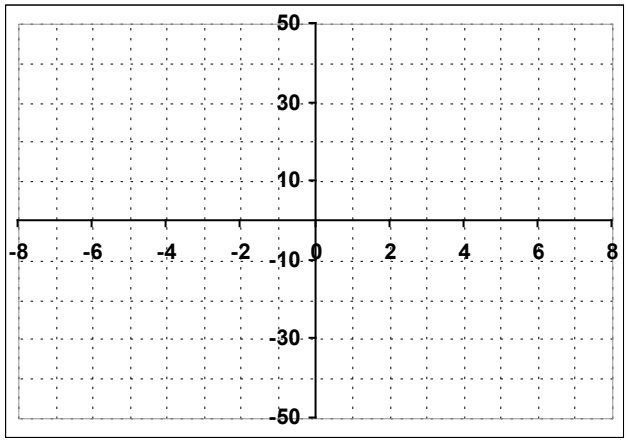


d. $f(x) = 2x(x+3)(x-1)(2x-7)$

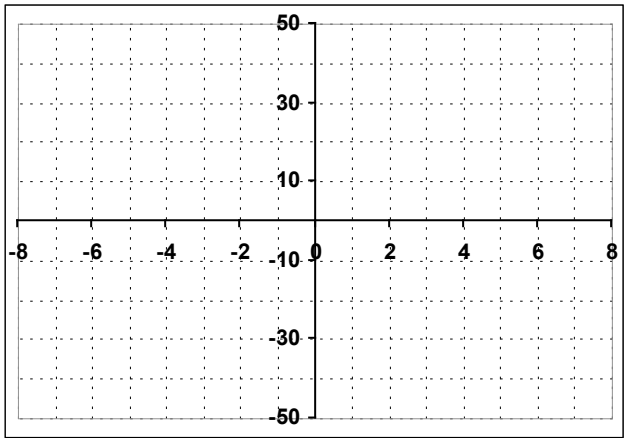


On the next two, you will need to factor the quadratic terms to find all the zeros.

e. $f(x) = (x-5)(x+1)(x^2-3x+2)$

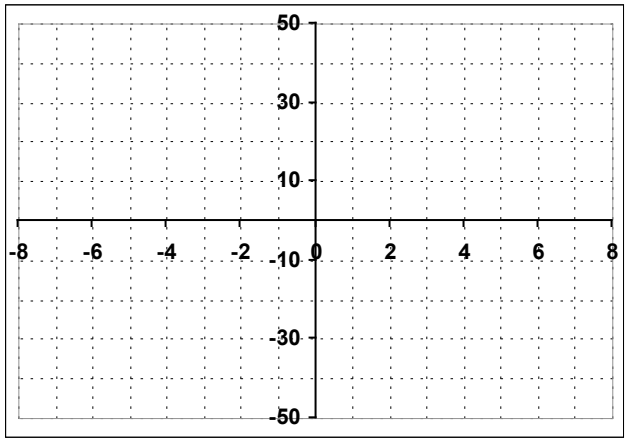


f. $f(x) = -3(x^2-2x-8)(2x^2+9x-5)$

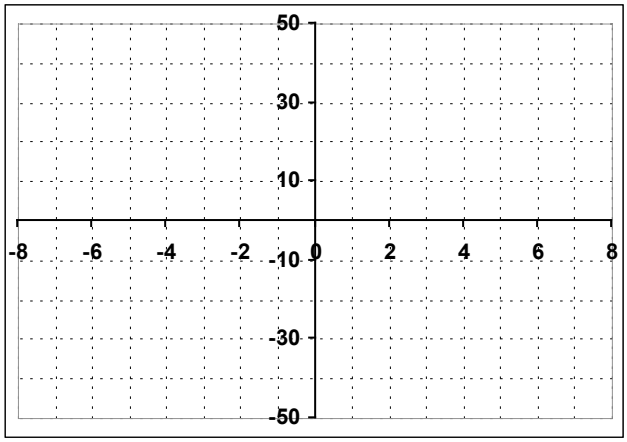


You need to factor the next two fully before graphing.

g. $f(x) = x^3 - 2x^2 - 15x$

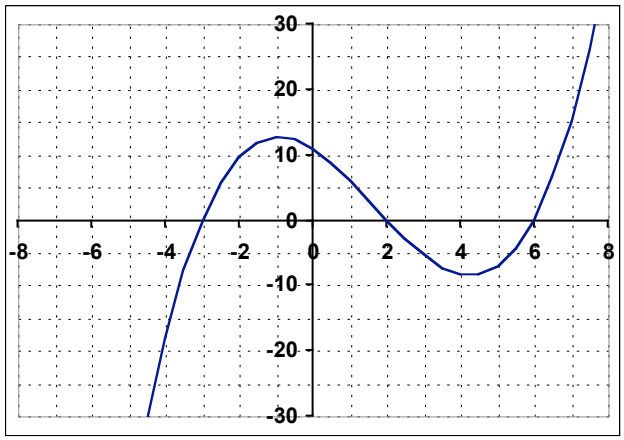


h. $f(x) = -3x^3 + 27x$

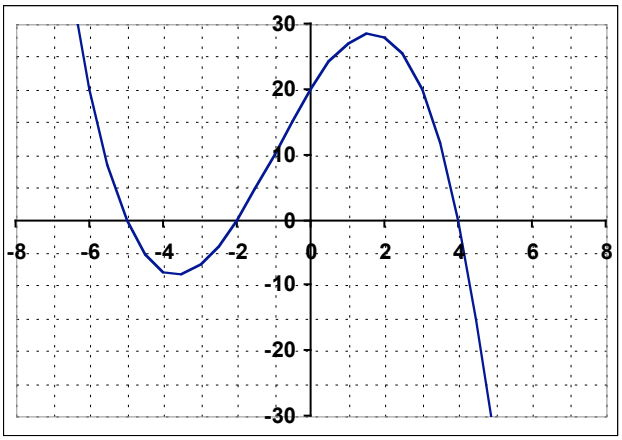


4. Write a possible equation for each graph below. Use the form $f(x) = a(x - \_\_)(x - \_\_)$..... You do not need to find the value of a, but state whether a is positive or negative (based on the end behavior.)

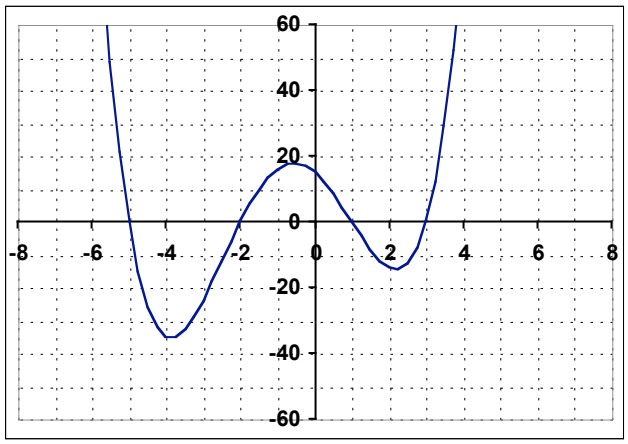
a.



b.



c.



d.