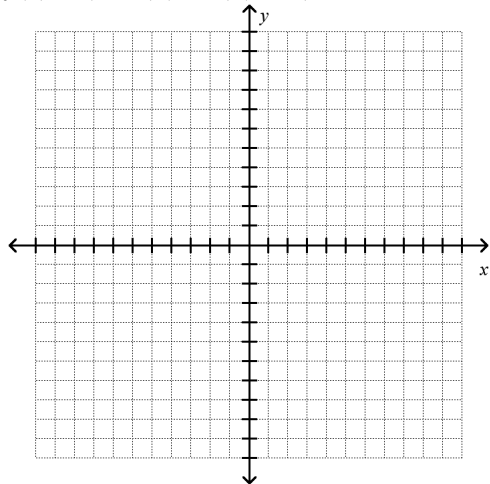


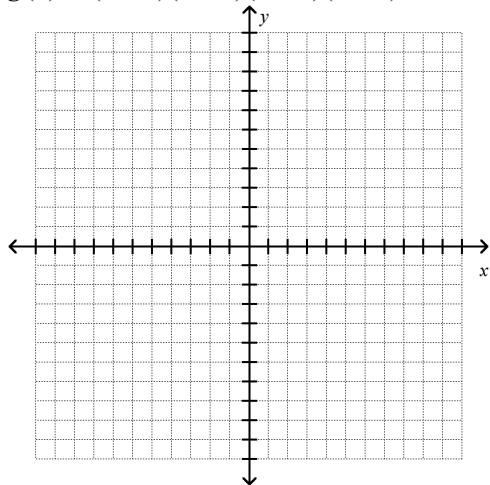
### Graphing Polynomials in factored form

Identify the zeros of each polynomial function.  
Use Desmos to graph each polynomial.

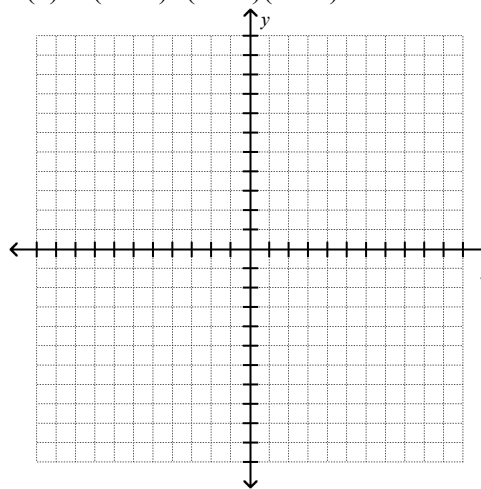
1.  $f(x) = (x - 3)(x + 3)(x - 1)$



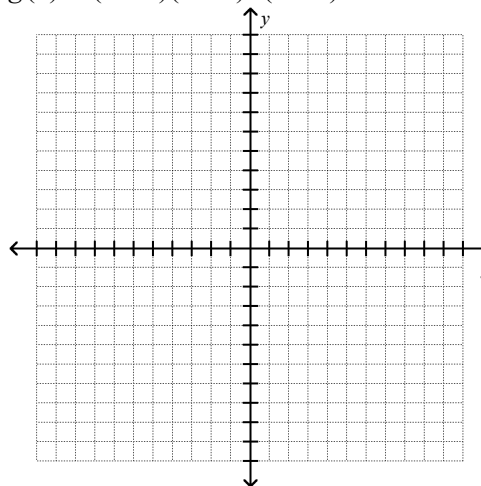
2.  $g(x) = (x - 4)(x - 5)(x + 2)(x + 3)$



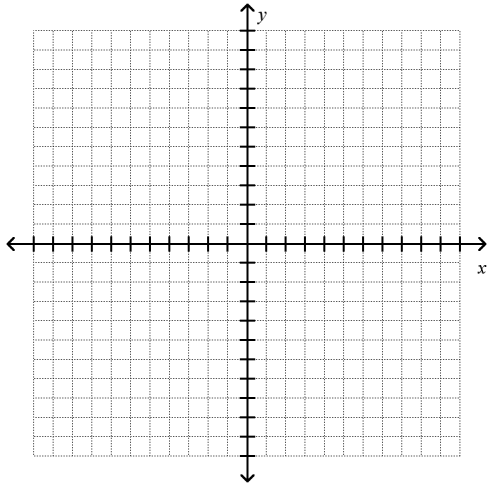
3.  $h(x) = (x + 3)^2(x - 1)(x - 5)$



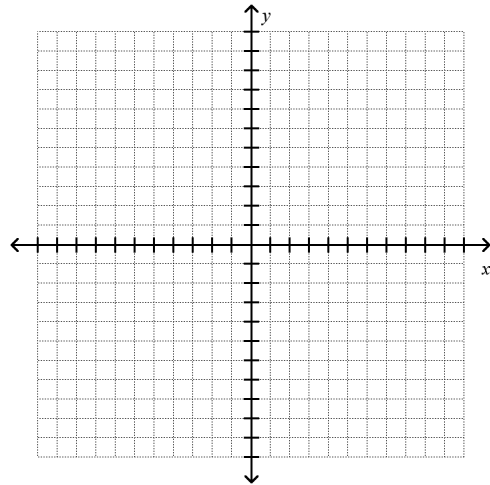
4.  $g(x) = (x - 2)(x + 2)^3(x + 6)$



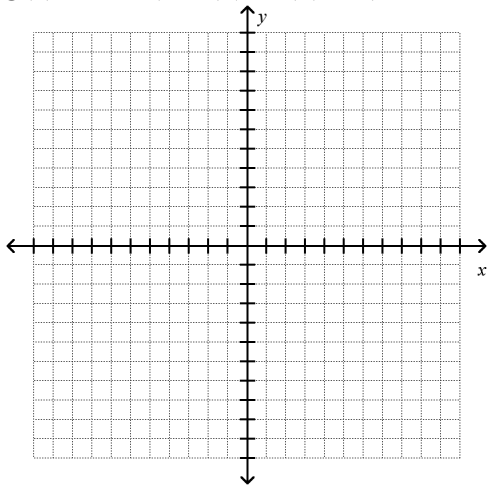
5.  $g(x) = -3x(x-1)(x-4)(x+2)$



8.  $g(x) = -(x+4)^3(x-3)(x+2)$



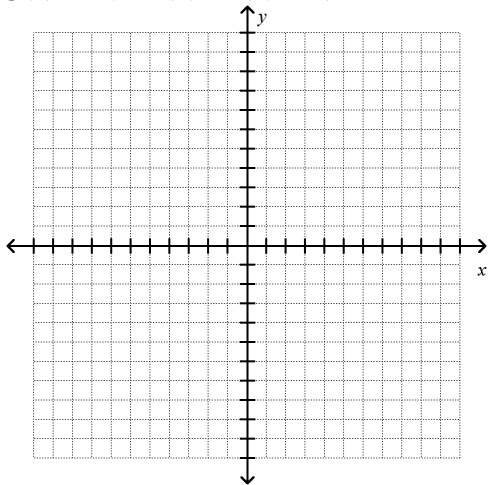
6.  $g(x) = -2x^2(x-2)(x-7)(x+1)$



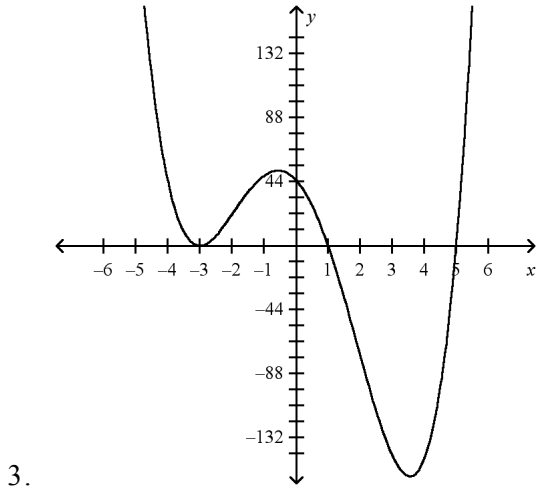
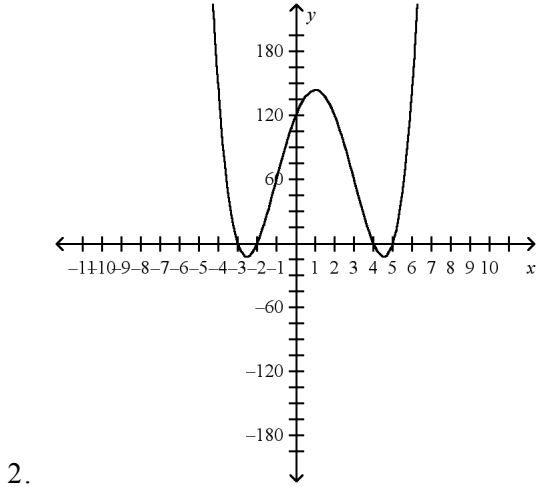
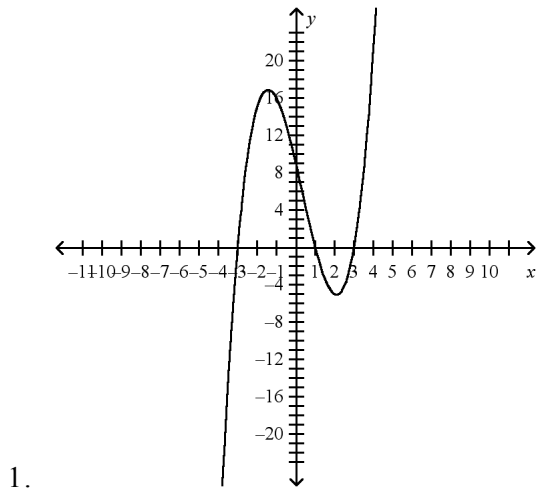
9. What do you notice about how the graph behaves at the zeros?

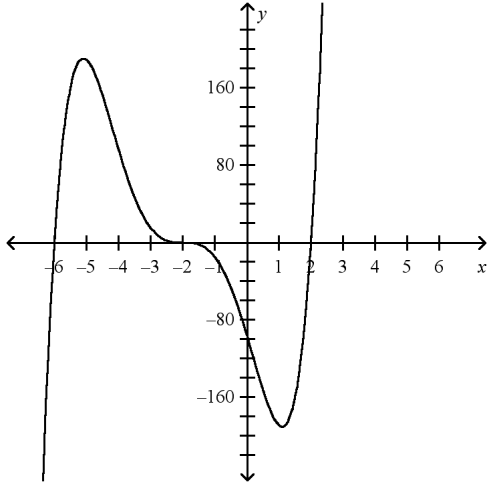
Is it different if the zero is squared or cubed?

7.  $g(x) = -(x+5)(x-9)(x+1)$

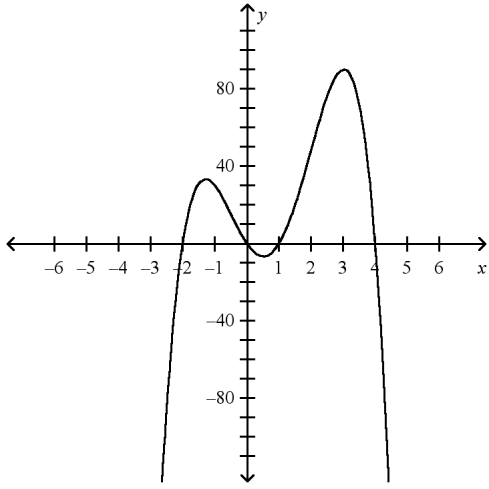


**Graphing Polynomials in factored form**  
**Answer Section**

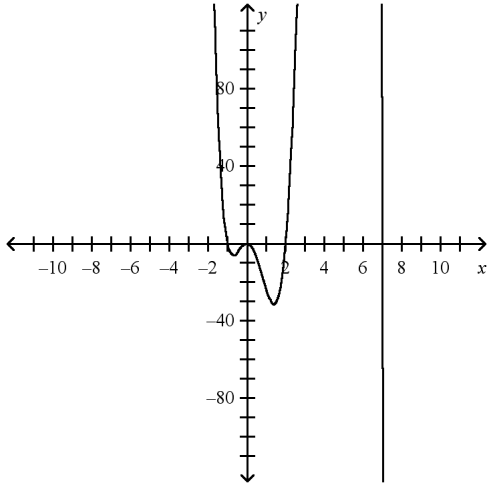




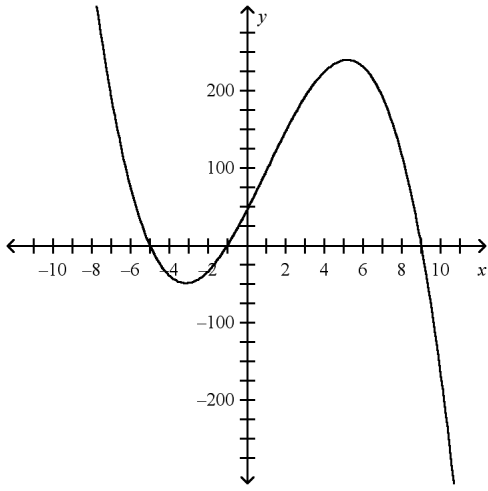
4.



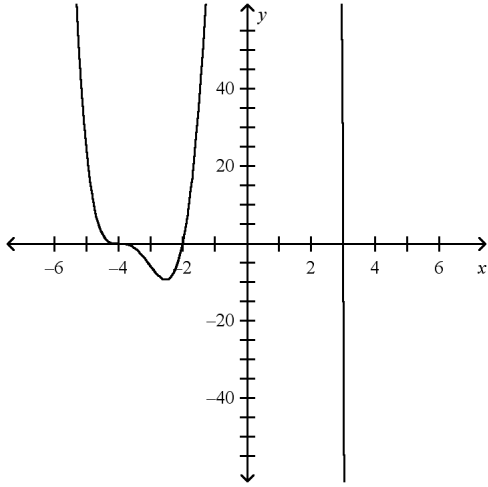
5.



6.



7.



8.

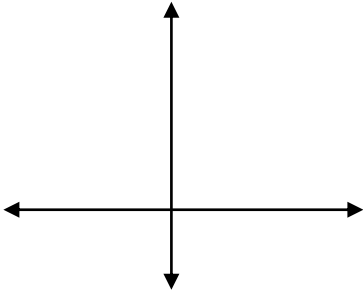
9. It passes through the single zeros, bounces off the squared ones and curves through the cubed ones

Name: \_\_\_\_\_

### Review Graphing Polynomials

I. Sketch the following polynomials on the axis provided. Find all the zeros for each polynomial, indicate any multiplicities other than 1, and determine end behavior.

1)  $f(x) = (x+1)(x-2)$



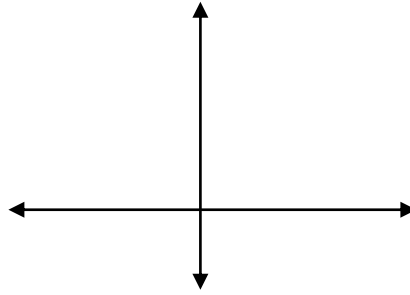
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

mult: \_\_\_\_\_

2)  $g(x) = -(x+3)(x+2)(x-1)$



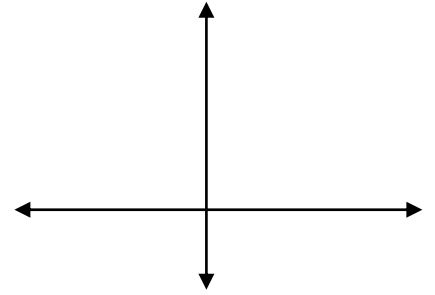
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

mult: \_\_\_\_\_

3)  $h(x) = -x(x-2)(x+4)(x+1)$



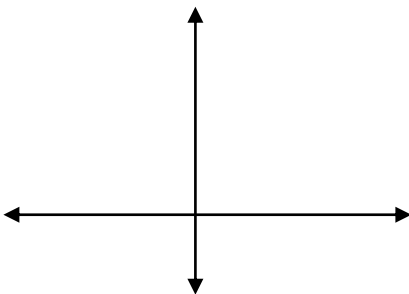
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

mult: \_\_\_\_\_

4)  $p(x) = (x-2)^2(x+3)$



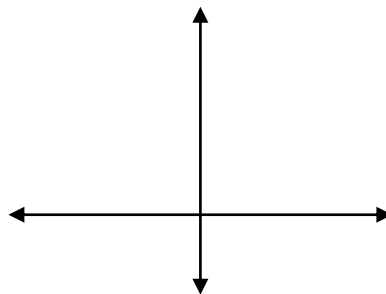
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

mult: \_\_\_\_\_

5)  $j(x) = -3(x+1)^3x^2$



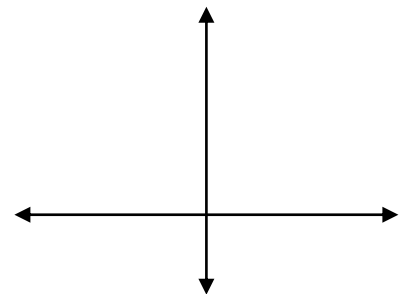
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

mult: \_\_\_\_\_

6)  $f(x) = -(x+3)^5(x-1)$



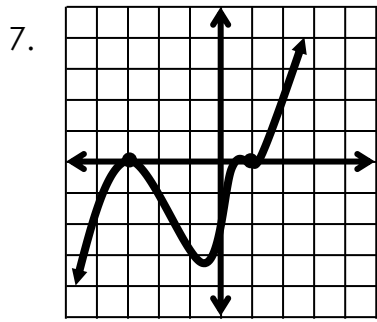
Leading term \_\_\_\_\_

End Behavior: \_\_\_\_\_

Zeros: \_\_\_\_\_

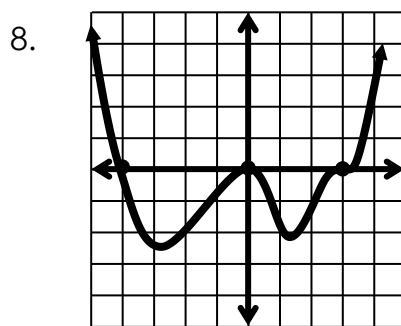
mult: \_\_\_\_\_

II. Find an equation for the following polynomials. (Factored form.)



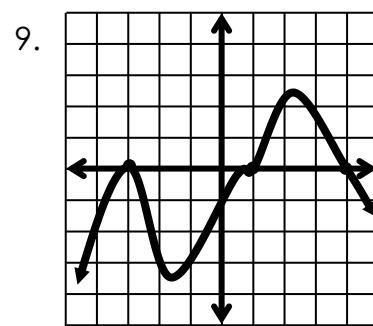
5<sup>th</sup> degree

\_\_\_\_\_



6<sup>th</sup> degree

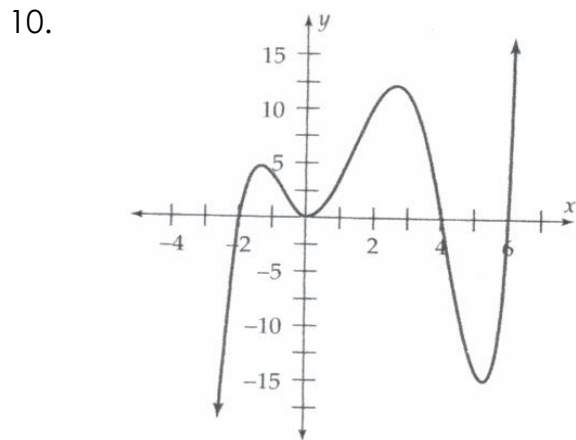
\_\_\_\_\_



8<sup>th</sup> degree

\_\_\_\_\_

III A complete graph of a polynomial is shown. a) Is the degree even or odd? b) Is the leading coefficient positive or negative? c) What are the real zeros? d) What is the smallest possible degree?

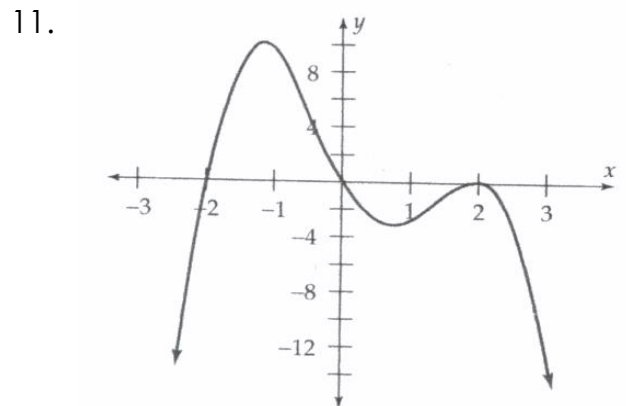


a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

d) \_\_\_\_\_



a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

d) \_\_\_\_\_