Estimating and Graphing Polynomials LCHL

Using Geogebra, graph the following polynomials and fill in the table below after graphing each one

NOTE: to put indices into an equation use **SHIFT and 6** on keyboard to get ^ symbol, then type degree required [e.g for $(x-5)^2$ you'd type in ^2]

Polynomial	Leading coefficient (term with biggest degree/power) positive or negative?	Equation of degree?	Number of roots?	List of roots	Where it crosses x=axis	Where it touches (but doesn't cross) x-axis	End behaviour = Direction of ends/arms (up or down) Both same/different/which up/which down
$f(x) = x(x-1)(x-2)(x-3)$							
$f(x) = x\,(x-2)\,(x+5)$							
$y = x(x+4)(x-7)(x-2)(x-5)^2$							
$y = (-x)(x+4)(x-2)(x-5)^2$							
$y = (x)^2(x+2)^3$							
$y = x^5 - 12x^4 - 40x^3 + 120x^2$							
$y = -x(x+3)(x+4)^3$							

(Reflection: What examples above have the same characteristics? Is there a pattern to how each graph looks compared to the equation?)

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What conclusions can you draw from your graphs and table about the following:

A polynomial of even degree?
A polynomial of odd degree?
The leading coefficient is positive?
The leading coefficient is negative?
Polynomial which has a factor or root which occurs multiple times (known as Multiplicity)?
Polynomial which has a factor or root which occurs 2 times?
Polynomial which has a factor or root which occurs 3 times?

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