Sketch the following polynomials. Consider the overall degree to determine end behavior. Use the factored form of the polynomial to find the zeros (x-intercepts) ... and sketch the correct zero behavior.

\[ f(x) = x(x+3)^2(x-1)^3 \]
\[ g(x) = -(x-1)^3(x+2)(x-3) \]
\[ g(x) = x^4 - 5x^2 + 4 \]
\[ (x^2 - 4)(x^2 - 1) \]
\[ (x-2)(x+2)(x-1)(x+1) \]

\[ f(x) = -x^3 + 2x^2 - x + 2 \]
\[ -x^3(x-2) - (x-2) \]
\[ -(x^2 + 1)(x-2) \]

\[ f(x) = x^3 - x \]
\[ X(x^4 - 1) \]
\[ X(x^2 - 1)(x^2 + 1) \]
\[ X(x-1)(x+1) \]

\[ f(x) = x^4 - 9x \]
\[ X(x^2 - a) \]
\[ X(x - 3)(x + 3) \]

\[ f(x) = (x+2)^3(x-1)^2 \]
\[ f(x) = -(x-2)(x+1)^3x^2 \]
\[ f(x) = (x-3)(x+1)^2x^3 \]
The cubic polynomial \( p(x) \) has a zero of multiplicity two at \( x = 1 \) and a zero of multiplicity one at \( x = 2 \). Also \( p(-1) = 2 \). Determine \( p(x) \) and sketch the graph.

\[
p(x) = a(x-1)^2(x-2)
\]

\[
a = \frac{a}{-1-2}
\]

\[
a = \frac{a}{-3}
\]

\[
a = \frac{-1}{-3a}
\]

\[
\frac{1}{-3a}
\]

\[
-1 = \frac{1}{-3a}
\]

\[
p(x) = \frac{-1}{-3a}(x-1)^2(x-2)
\]