Precalculus – Graphing rational functions by hand.

For each function below, find the following:

1) x and y intercepts
2) vertical asymptotes
3) horizontal asymptotes
4) Sketch a complete graph by showing test points in various regions of the graph.

1) f(x) = $\frac{x-1}{x^2+3x+2}$

2) h(x) = $\frac{-2x^2+3x+2}{x^2-x-12}$

3) g(x) = $\frac{2x^2}{x^2+x-12}$

4) p(x) = $\frac{(x+8)(x-3)}{(x-5)(x^2+7x+12)}$

5) f(x) = $\frac{3x-2}{x+3}$

6) g(x) = $\frac{1}{x(x+1)^2}$

7) Write the equation of the rational function having these characteristics.
   a) vertical asymptotes at x = 4 and x = -1
   b) x intercepts at (3, 0), (-2, 0)
   c) horizontal asymptote at y = 2/3
   d) y intercept at (0, 1)

8) Divide using long division

   $(3x^3 + 4x - 1)/ (x^2 + 1)$