1. Which of the following are polynomials?
   (a) \( g(x) = 3 + 4x^{1/2} \)
   (b) \( f(x) = 1 - 12x^4 \)
   (c) \( h(x) = (x^2)(x^2 - 4x + 1) \)
   (d) \( F(x) = \frac{x^2}{x^2 - 4x + 1} \)
   (e) \( f(x) = -3 \)
   (f) \( h(x) = 7x^5 + \sqrt{2}x^3 - \frac{\pi}{2}x^2 + x \)

2. Find a polynomial function of degree three whose zeros are \(-4, -1, \text{ and } 3\).

3. Identify the zeros of \( g(x) = -3(x - 3)(x + 1)^2(x - \frac{1}{3})(x + 5)^4 \), then state their multiplicities.

4. For \( f(x) = x^2(x + 2) \)
   (a) Find the \( x \) and \( y \) intercepts.
   (b) Use the \( x \) intercepts to located the intervals where the graph is above the \( x \) axis and where it is below the \( x \) axis.
   (c) Locate other points on the graph.
   (d) Sketch the graph of \( f(x) \)

5. For \( f(x) = -3(2x - 1)^2(x + 2) \)
   (a) Determine the end behavior of the graph.
   (b) Find the \( x \) and \( y \) intercepts
   (c) Determine the zeros of the function and their multiplicities. Determine if the graph touches or crosses the \( x \) axis at each intercepted
   (d) Determine the behavior near each intercept
   (e) Determine the maximum number of turning points
   (f) Sketch \( f(x) \)