1. Find the leading term and use it to determine the long-term behavior of each polynomial function.

   (a) $f(x) = x^3 + 2x - 1$

   (b) $f(x) = -x^2 + 4$

   (c) $f(x) = -(x+2)^2(x-1)(x-3)^2$

   (d) $f(x) = (x^2 + 2x - 1)^2(3x-5)^4$

2. Find all roots and their degrees. Describe the behavior of the graph at each root.

   (a) $g(x) = (x+1)(x-2)^2(x-4)$

   (b) $g(x) = (2x-1)(x+6)^4$

   (c) $g(x) = (x^2 - 5x + 6)(x^2 - 16)$

   (d) $g(x) = (x^2+1)(x^2-9)^2$

3. Give the degree of each polynomial function. At most how many turning points does each graph have?

   (a) $h(x) = x(x+7)(x-2)(x-5)$

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

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

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

4. Sketch the graph of each polynomial function. Label all roots with their degrees and mark all intercepts. The graph must be smooth and continuous.

   (a) $f(x) = x(x-1)(x-3)(x-5)$

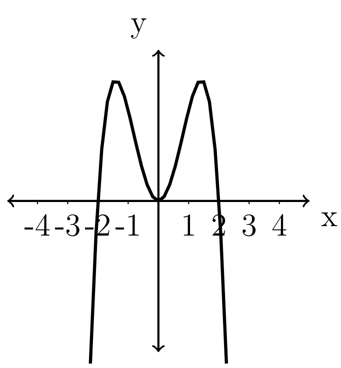
   (b) $f(x) = -(x-2)^2(x+1)^3$

   (c) $f(x) = (x^2 + 4x + 3)^2$

   (d) $f(x) = (x-1)^2(x^2+4x+4)(3-x)$

5. *Working backwards.* Find a possible polynomial function for each graph with the given degree. The y-axis is left intentionally without scale.

   (a) degree 4



   (b) degree 6