3. [11 points] No work or explanation is required on this page.
   a. [4 points] Determine which, if any, of the functions listed below satisfy all of the following:
      • It has a zero at \( x = -5 \).
      • Its long-run behavior satisfies \( y \rightarrow -\infty \) as \( x \rightarrow \infty \).
      • Its long-run behavior satisfies \( y \rightarrow -\infty \) as \( x \rightarrow -\infty \).
      (Circle all of the functions that satisfy all three conditions, if there are any; otherwise, circle None of these.)
      i. \( y = -4(x - 5)(x - 1)^2(x + 2) \)
      ii. \( y = 2(x + 5)(x + 1)^2(x - 2)^2 \)
      iii. \( y = -4(x + 5)(x + 1)^2(x - 2) \)
      iv. \( y = -4(x - 5)(x + 1) \)
      v. \( y = -4(x + 5)(x + 1)^2(x - 5) \)
      vi. \( y = -2(x + 5)(x - 5)(x - 2) \)
      vii. None of these

   b. [3 points] Which, if any, of the following functions have \( y = 2 \) as a horizontal asymptote? Circle your answer(s).
      i. \( y = \frac{6x^4 - 5x^2 + 3}{3x^4 + 2x - 1} \)
      ii. \( y = \frac{(2x - 1)(x + 3)(x - 5)}{(x + 1)(x - 4)} \)
      iii. \( y = \frac{2e^x + x^2}{2 + e^x} \)
      iv. \( y = \frac{2 \ln x + x}{\ln x + 3} \)
      v. None of these

   c. [4 points] Data for a function \( g(s) \) is given in the following table.
      \[
      \begin{array}{c|cccccc}
        s & -4 & -2 & -1 & 1 & 3 \\
        \hline
        g(s) & 13 & 5 & 2 & -2 & -4 \\
      \end{array}
      \]
      For each property listed below, determine whether \( g(s) \) could have that property on the entire domain \([-4, 3]\). (Circle each term that could describe \( g(s) \), if there are any; otherwise, circle None of these.)
      i. INCREASING
      ii. DECREASING
      iii. CONCAVE UP
      iv. CONCAVE DOWN
      v. AN ODD FUNCTION
      vi. AN EVEN FUNCTION
      vii. AN INVERTIBLE FUNCTION
      viii. A LINEAR FUNCTION
      ix. AN EXPONENTIAL FUNCTION
      x. None of these