Classroom Examples for Pre-Calculus #4

1) Solve $x^{\frac{1}{3}} + 10x^{\frac{1}{6}} = -24$

2) Graph, determine if the graph is a function and, if it is, rewrite the relation using function notation, find all relative maxima and minima, determine the domain and range, and identify the intervals where the graph is increasing or decreasing for the following piecewise relation

$$y = \begin{cases} -|x+4|-3 & \text{for } x < -2 \\ 2x^2 - 4 & \text{for } -2 \le x < 2 \\ \dfrac{3}{5}x - 5 & \text{for } x \ge 2 \end{cases}$$

3) Solve $x^{\frac{1}{2}} - 13x^{\frac{1}{4}} = 30$

4) Graph, determine if the graph is a function and, if it is, rewrite the relation using function notation, find all relative maxima and minima, determine the domain and range, and identify the intervals where the graph is increasing or decreasing for the relation $y = -\dfrac{x^3}{3} + 4x - 2$

5) Solve $6\sqrt[3]{x} - 11\sqrt[6]{x} = -3$

6) Graph, determine if the graph is a function and, if it is, rewrite the relation using function notation, find all relative maxima and minima, determine the domain and range, and identify the intervals where the graph is increasing or decreasing for the following piecewise relation

$$y = \begin{cases} \dfrac{x^2}{2} + 6x + 17 & \text{for } x < -4 \\ \dfrac{-x^3}{9} + 1 & \text{for } -4 \le x \le 3 \\ -|x-6|+2 & \text{for } x > 3 \end{cases}$$

7) Solve $x^4 - x^2 = 72$

8) Graph, determine if the graph is a function and, if it is, rewrite the relation using function notation, find all relative maxima and minima, determine the domain and range, and identify the intervals where the graph is increasing or decreasing for the relation

$$y = \frac{x^4}{4} - x^3 - 3x^2 + 8x + 6$$

   ***Plus create graphs by hand that ask the same info as in number 8