1. Sketch the graph of $y = x^{1/3} + x^{-2/3}$ by computing y' and y'', and determining their signs; finding the critical points, the inflections points, the intercepts, and the asymptotes; and clearly labeling them in the picture.

$$y' = \frac{1}{3}x^{-2/3} - \frac{2}{3}x^{-5/3} = \frac{1}{3}x^{-5/3}(x-2) = 0 \Rightarrow x = 2$$

undefined when $x = 0$.

$$y'' = -\frac{2}{9}x^{-5/3} + \frac{10}{9}x^{-8/3} = -\frac{2}{9}x^{-8/3}(x-5) = 0 \Rightarrow x = 5$$

x		0		2		5	
y'	$+$	‖	$-$	0	$+$		$+$
y''	$+$	‖	$+$		$+$	0	$-$
	)	‖	(		)		(

$\lim_{x \to 0} y = \infty$

$x = 2 \Rightarrow y = 3 \cdot 2^{-2/3}$

$x = 5 \Rightarrow y = 6 \cdot 5^{-2/3}$

$y = 0 \Rightarrow x^{1/3} + x^{-2/3} = 0$

$\Rightarrow x^{-2/3}(x+1) = 0 \Rightarrow x = -1$