

Name: _____ ID #: _____ List #: _____

Instructions: Write clearly and neatly. Show your work.

1. Sketch the graph of $f(x) = \frac{x}{x^2 + 1}$. Give all details.

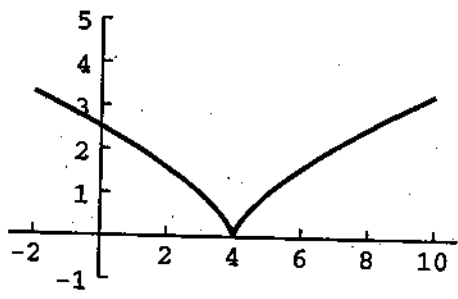
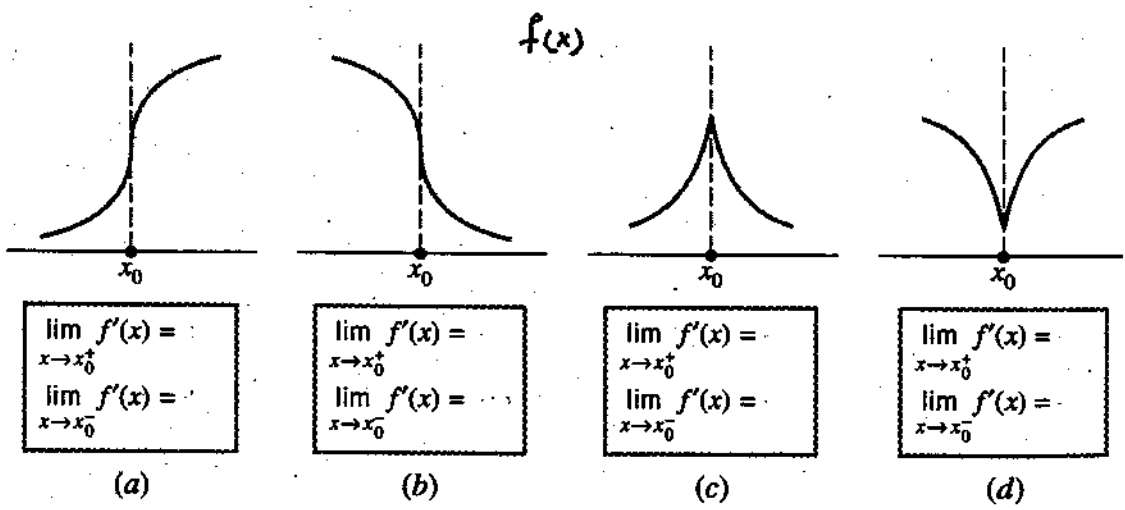
2. Suppose that the position function of a particle moving on a coordinate line is given by $s(t) = \begin{cases} 2 \sin t, & 0 \leq t < 3\pi/2 \\ -2, & t \geq 3\pi/2 \end{cases}$. Analyze the motion of the particle for $t \geq 0$. Sketch the graph.

(a) Moving in the positive direction. (b) Moving in the negative direction.

(c) Speeding up. (d) Slowing down.

(e) Momentarily stopped. (f) Remaining stationary.

3.

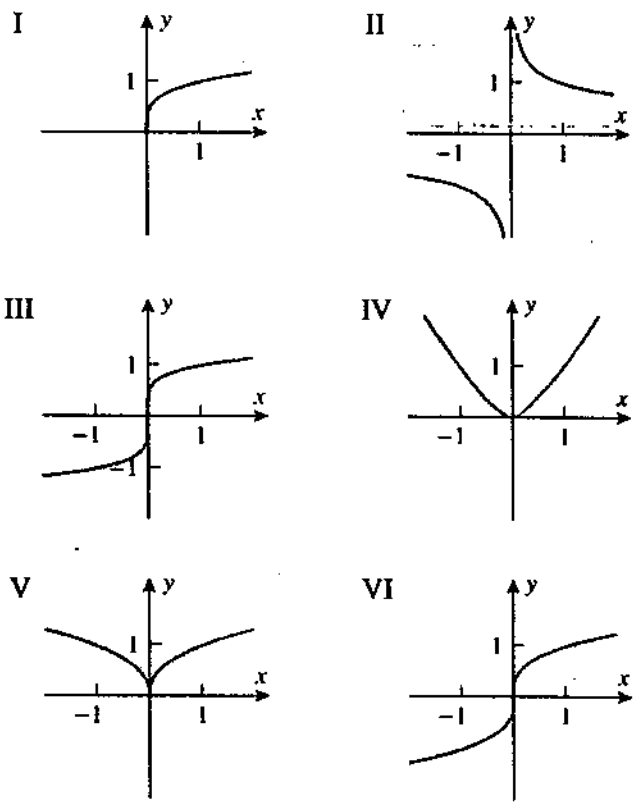


Generated by Mathematica (e)
 $y =$

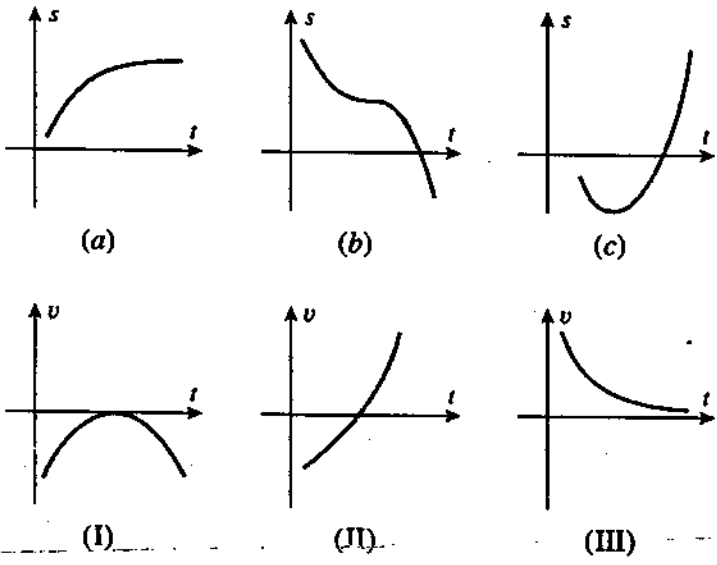
4.

In each part, match the function with graphs I–VI without using a graphing utility, and then use a graphing utility to generate the graphs.

- (a) $x^{1/3}$ (b) $x^{1/4}$ (c) $x^{1/5}$
 (d) $x^{2/5}$ (e) $x^{4/3}$ (f) $x^{-1/3}$



For the graphs in the accompanying figure, match the position functions with their corresponding velocity functions.



6.

