

# RECITATION QUESTIONS

MATH 119

(WEEK 5)

1. Use the guidelines of (s 4.5) to sketch the curve

a)  $y = x^4 + 4x^3$

b)  $y = \frac{x^3}{x^3 + 3}$

c)  $y = x\sqrt{5 - x}$

d)  $y = x \tan x, \quad -\frac{\pi}{2} < x < \frac{\pi}{2}$

2. Find the equation of the slant asymptote of the graph of

$$y = \frac{x^2 + 1}{x + 1}$$

3. Show that the curve  $y = \sqrt{x^2 + 4x}$  has two slant asymptotes  $y = x + 2$  and  $y = -x - 2$ . Use this fact to help sketch the curve.

4. Find the point on the line  $y = 4x + 7$  that is closest to the origin.

5. Find the dimensions of the rectangle of largest area that can be inscribed in an equilateral triangle of side  $L$  if one side of the rectangle lies on the base of the triangle.

6. A cone with height  $h$  is inscribed in a larger cone with height  $H$  so that its vertex is at the center of the base of the larger cone. Show that the inner cone has maximum volume when  $h = \frac{1}{3}H$