2007-2008 FALL
MATH 119
WEEK 2
RECITATION QUESTIONS

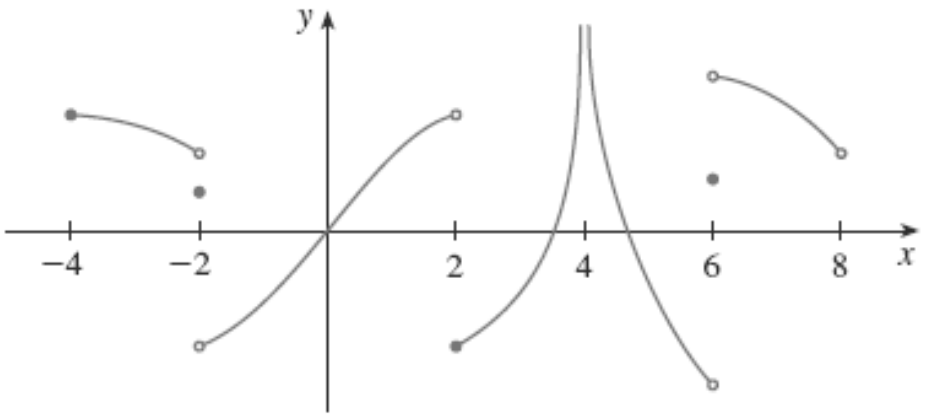
1) Prove $\lim_{x\to 1}(2x+3)=5$ using the ϵ,δ definition of limit and illustrate with a diagram.

2) Prove, using definition of infinite limits, that $\lim_{x\to -1}\dfrac{1}{(x+3)^4}=\infty$.

3) For what values of the constant c is the function f continuous on $(-\infty,\infty)$

$$f(x)=\begin{cases} cx+1 & \text{if } x\le 3 \\ cx^2-1 & \text{if } x>3 \end{cases}$$

4) From the graph of g, state the intervals on which g is continuous.



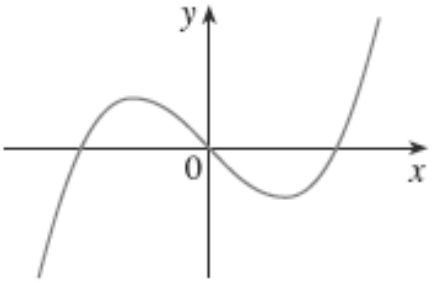
5) Use the intermediate value theorem to show that there is a root of the equation $x^4+x-3=0$ in the interval $(1,2)$.

6) Fin an equation of the tangent line to the curve $y=\sqrt{2x+1}$ at the point $(4,3)$.

7) Sketch the graph of a function f for which $f(0)=0, f'(0)=3, f'(1)=0$, and $f'(2)=-1$.

8) Find $f'(a)$ if $f(t)=\frac{2t+1}{t+3}$

9) Trace or copy the graph of the given function f. (Assume that the axes have equal scales.) Then use the method of Example 1 (in section 3.2) to sketch the graph of f' below it.



10) Find the derivative of the function $f(x) = 1 - 3x^2$ using the definition of derivative. State the domain of f and the domain of its derivative.

11) Differentiate the function $v = t^2 - \frac{1}{\sqrt[4]{t^3}}$.

12) Differentiate $F(y) = \left(\frac{1}{y^2} - \frac{3}{y^4}\right)(y + 5y^3)$.

13) Find an equation of the tangent line to the curve $y = \frac{2x}{x+1}$ at the point $(1, 1)$.