NO CALCULATORS

The student should be able to...

...write a piecewise function from a rational function that includes an absolute value; then find its one-sided limits

...evaluate limits (finite and infinite) and discuss continuity from a "generic graph" (See "Limits: A Graphical Approach" worksheet)

...evaluate limits (both existant and one-sided) of all the function families

Tips:

- be able to mentally "picture" the graph made by each type)
- "massage the limit" to reveal cancellations (removable discontinuities) two tips for massages: factor the denominator; also rational the *numerator*
- Use properties of limits: p57 table

- ...justifiably find asymptotes of functions using the limit definitions.
- ...demonstrate Continuity at a point using the three conditions necessary

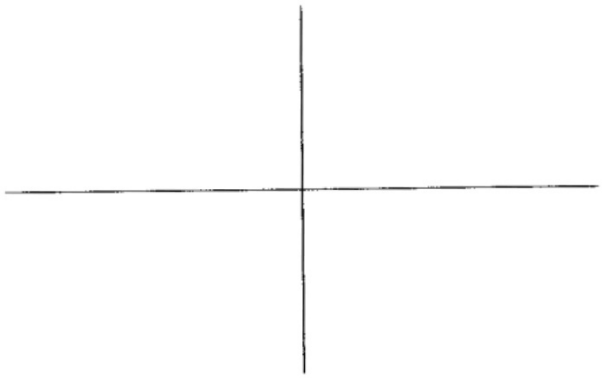
- ....explain, with evidence, why a given function has a zero (that is, f(c) = 0, for some c in (a,b)) for a continuous function

...given either a function (perhaps piecewise) or a graph of a function, identify with justification the types of discontinuities present. (Jump, removable, infinite)

...sketch a possible graph for a function given certain requirements (expressed as limits)

ex: Graph a possible graph for the function $P(x)$ satisfying the following conditions:

$$\lim_{x\to\infty} P(x) = -2 \quad \lim_{x\to-\infty} P(x) = 5 \quad \lim_{x\to 0^+} P(x) = -\infty \quad \lim_{x\to 0^-} P(x) = -6$$



...solve a system of equations to find a and b to make a given piecewise function continuous over the entire real line:

ex: Find a and b to make f(x) everywhere continuous.

$$f(x) = \begin{cases} 5bx - 6a, \text{ if } x < -2 \\ -3b - 4ax, \text{ if } x = -2 \\ 5x - 1, \text{ if } x > -2 \end{cases}$$