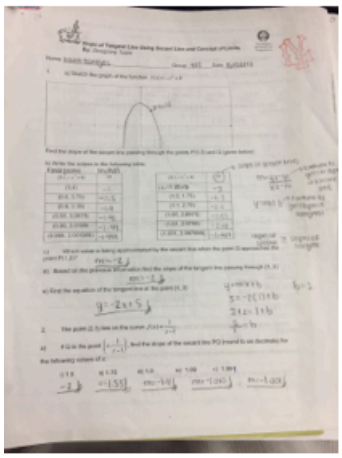
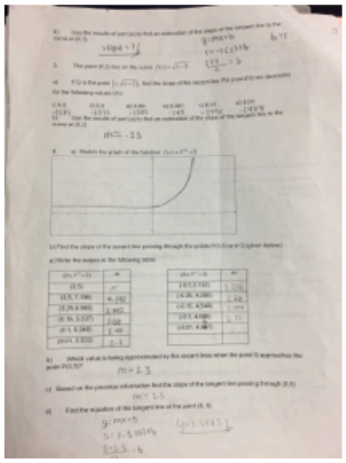
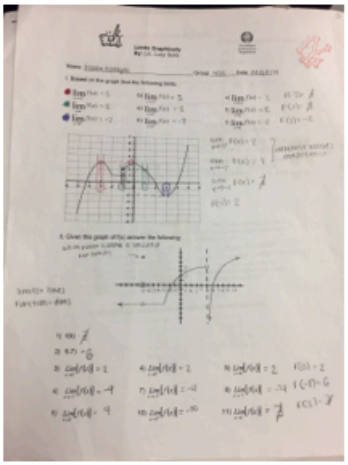
FIRST PARTIAL ACTIVITIES

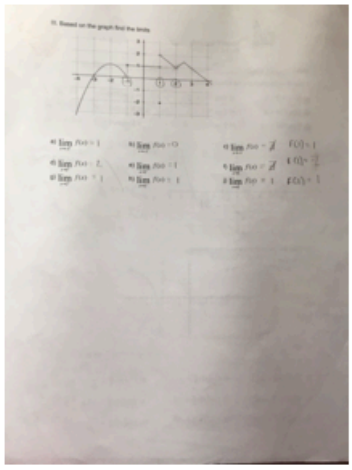
Slope of Tangent line using Secant lines



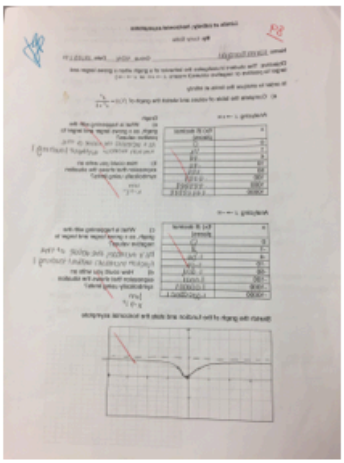


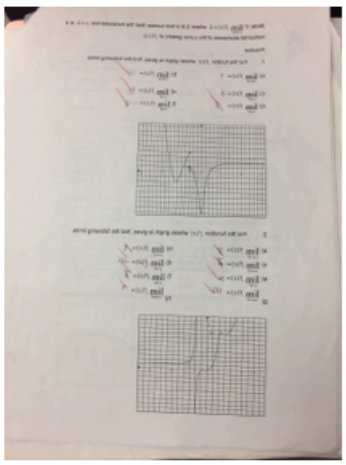
Limits graphically

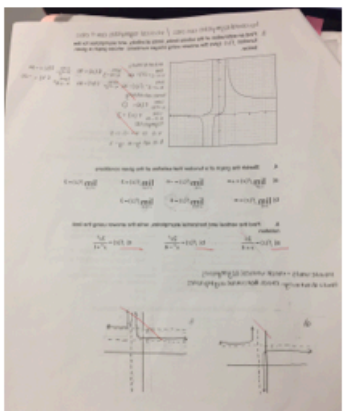




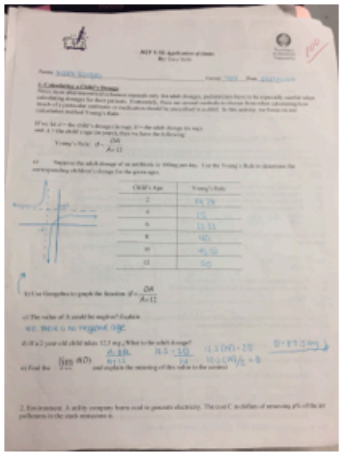
Limits at infinity: horizontal asymptotes

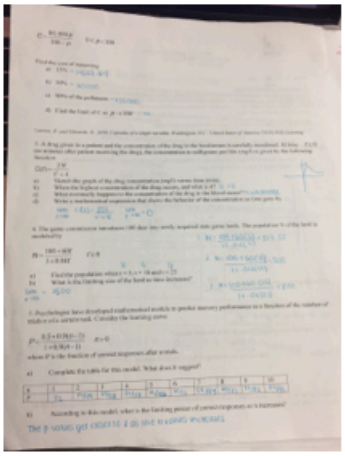




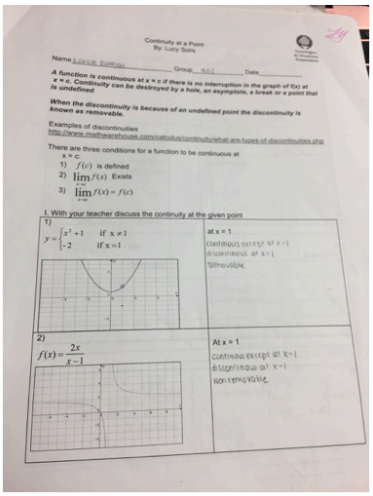


Application limits





Continuity at a point



Continuity at a Point
By: Lucy Solis

Name Karen Santos Group 402 Date

A function is continuous at x = c if there is no interruption in the graph of f(x) at x = c. Continuity can be destroyed by a hole, an asymptote, a break or a point that is undefined

When the discontinuity is because of an undefined point the discontinuity is known as removable.

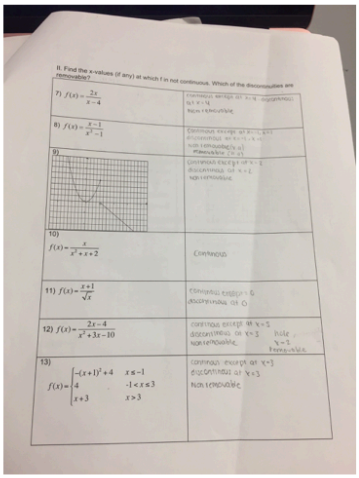
Examples of discontinuities
http://www.mathwarehouse.com/calculus/continuity/what-are-types-of-discontinuities.php

There are three conditions for a function to be continuous at x = c:

1) $f(c)$ is defined
2) $\lim_{x \to c} f(x)$ Exists
3) $\lim_{x \to c} f(x) = f(c)$

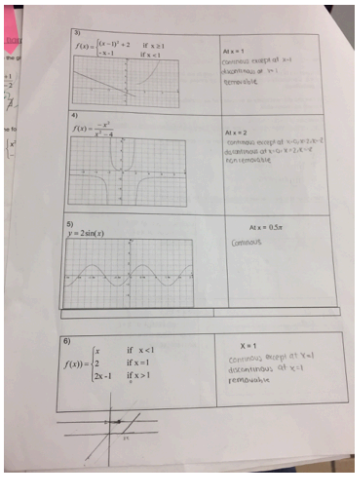
I. With your teacher discuss the continuity at the given point

1) $y = \begin{cases} x^2+1 & \text{if } x \neq 1 \\ -2 & \text{if } x = 1 \end{cases}$	at x = 1 continous except at x=1 discontinous at x=1 removable
2) $f(x) = \frac{2x}{x-1}$	At x = 1 continous except at x=1 discontinous at x=1 non removable

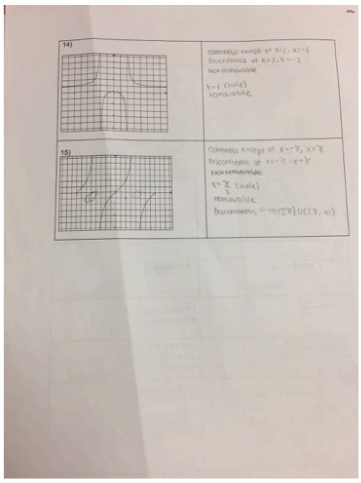


II. Find the x-values (if any) at which f in not continuous. Which of the discontinuities are removable?

7) $f(x) = \frac{2x}{x-4}$	continous except at x=4 discontinous at x=4 non removable
8) $f(x) = \frac{x-1}{x^2-1}$	continous except at x=-1, x=1 discontinous at x=-1, x=1 non removable (x=1) removable (x=-1)
9)	continous except at x=2 discontinous at x=2 non removable
10) $f(x) = \frac{x}{x^2+x+2}$	Continous
11) $f(x) = \frac{x+1}{\sqrt{x}}$	continous except = 0 discontinous at 0
12) $f(x) = \frac{2x-4}{x^2+3x-10}$	continous except at x=3 discontinous at x=3 non removable hole, x=2 removable
13) $f(x) = \begin{cases} -(x+1)^2+4 & x \leq -1 \\ 4 & -1 < x \leq 3 \\ x+3 & x > 3 \end{cases}$	continous except at x=3 discontinous at x=3 non removable



3) $f(x) = \begin{cases} (x-1)^2+2 & \text{if } x \geq 1 \\ -x-1 & \text{if } x < 1 \end{cases}$	At x = 1 continous except at x=1 discontinous at x=1 removable
4) $f(x) = \frac{-x^2}{x^2-4}$	At x = 2 continous except at x=-2, x=2, x=-2 discontinous at x=-2, x=2, x=-2 non removable
5) $y = 2\sin(x)$	At x = 0.5π Continous
6) $f(x)) = \begin{cases} x & \text{if } x < 1 \\ 2 & \text{if } x = 1 \\ 2x-1 & \text{if } x > 1 \end{cases}$	X = 1 continous except at x=1 discontinous at x=1 removable



14)	continous except at x=2, x=-2 Discontinous at x=2, x=-2 non removable x=1 (hole) removable
15)	Continous except at x=-π, x=π Discontinous at x=-π, x=π non removable x=π/2 (hole) removable Discontinous (-∞,-π) ∪ (π,∞)