

AP Calc Warm Up – 9/28/10

Name: _____

Period: _____

- 1) State whether the following functions have a discontinuity. If the function has a discontinuity then state the x-value for the discontinuity.

a. $f(x) = \frac{1}{x}$

b. $f(x) = \frac{\sin x}{x}$

c. $f(x) = \begin{cases} 2x, & x < 5 \\ 12, & x = 5 \\ -x + 15, & x > 5 \end{cases}$

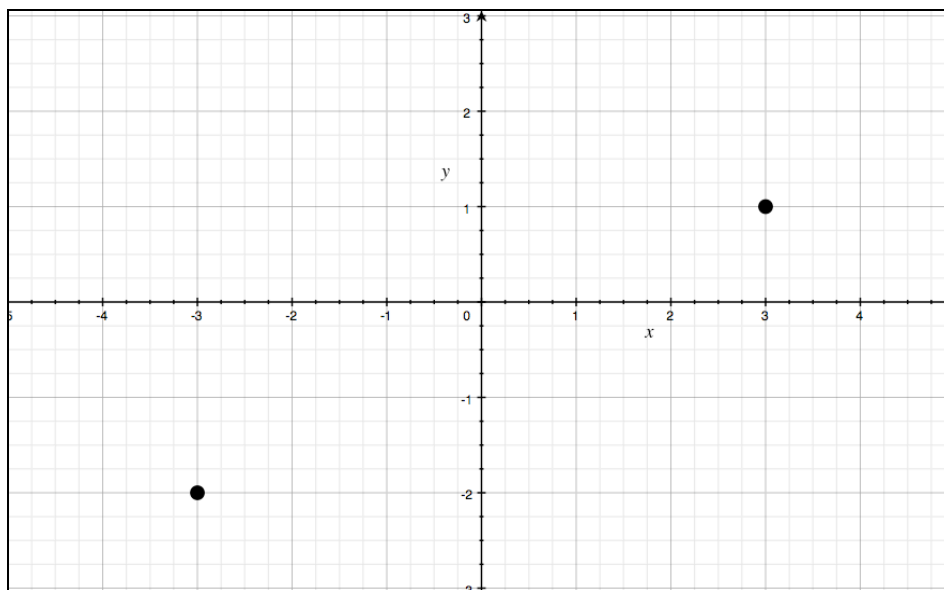
d. $f(x) = \begin{cases} \frac{x^2 - 3x + 2}{x - 2}, & x \neq 2 \\ 1, & x = 2 \end{cases}$

AP Calc

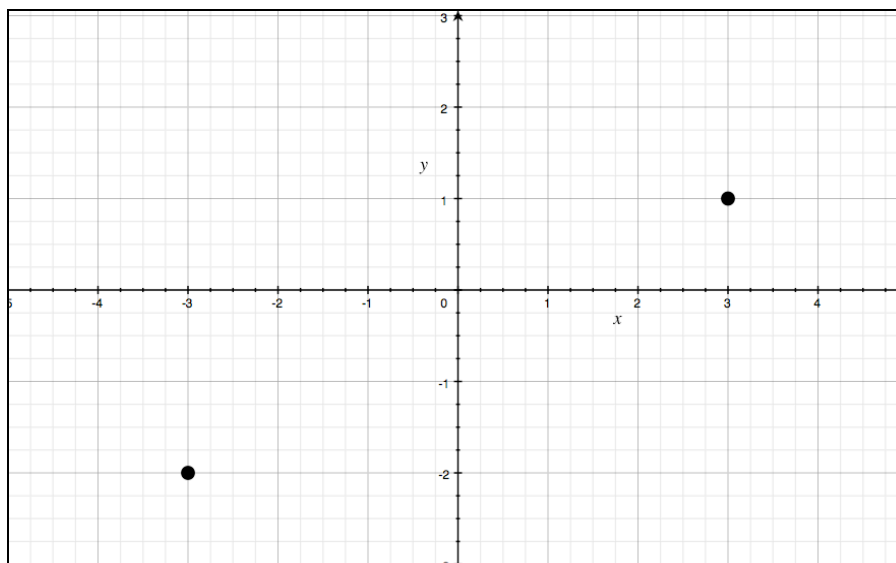
Intermediate Value Theorem – 9/28/10

Name: _____ Block: _____

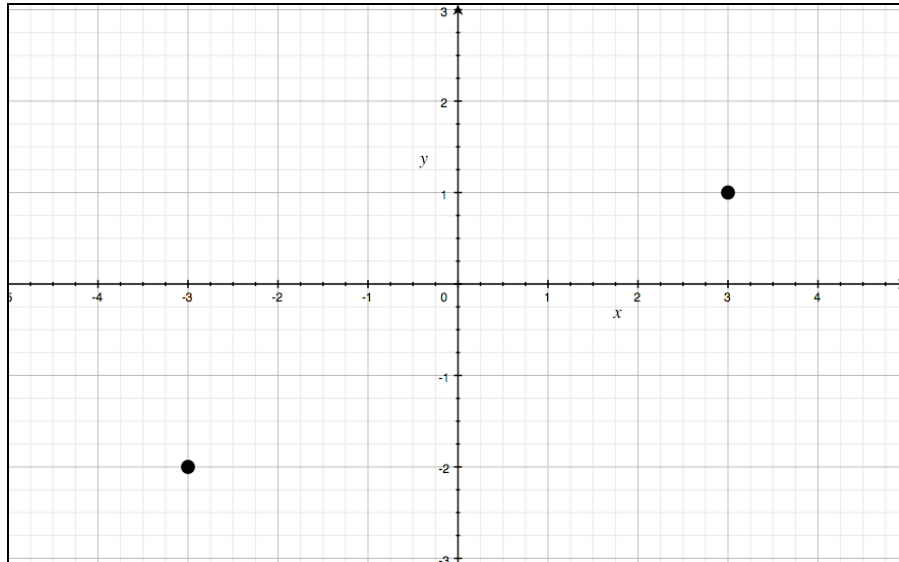
- 2) Here is your challenge: Sketch a function that is **CONTINUOUS** on the interval $[-3,3]$ and connects points $f(-3)$ and $f(3)$



- 3) Here is A NEW challenge: Draw a function that is **NOT CONTINUOUS** on the interval $[-3,3]$ and begins at $f(-3)$ and ends at $f(3)$ but does not go through the **y-value -1**



- 4) Here is another challenge: Draw a function that is CONTINUOUS on the interval $[-3,3]$ and begins at $f(-3)$ and ends at $f(3)$ but does not go through the **y-value -1**



Intermediate Value Theorem

Practice

1) Consider the following table:

x	2	1	4
$f(x)$	-1	6	-3

The function f is continuous on the closed interval $[2,4]$ and has values that are given in the table above. The equation f must pass through the x -axis at least how many times on the interval $[2,4]$? Why?

2) Consider the following table:

x	-1	2	5
$f(x)$	5	2	k

The function f is continuous on the closed interval $[-1,5]$ and has values that are given in the table above. Choose a value for k that ensures $f(x)$ has at least one zero (that is, cross the x -axis at least once).

3) Consider the following table:

x	-3	-1	2
$f(x)$	4	k	1

The function f is continuous on the closed interval $[-3,2]$ and has values that are given in the table above. The equation $f(x)=5$ must have at least two solutions on the interval $[-3,2]$ if $k=$

a) 2

b) 0

c) 5

d) -1

e) 7

AP Calc – Exit Slip – 9/28/10

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x	0	1	2
$f(x)$	1	k	2

26. The function f is continuous on the closed interval $[0, 2]$ and has values that are given in the table above. The equation $f(x) = \frac{1}{2}$ must have at least two solutions in the interval $[0, 2]$ if $k =$

(A) 0

(B) $\frac{1}{2}$

(C) 1

(D) 2

(E) 3