2.4 #2

HW #4

2. $0 < |x-5| < \delta$ $|f(x)-3| < 0.6$

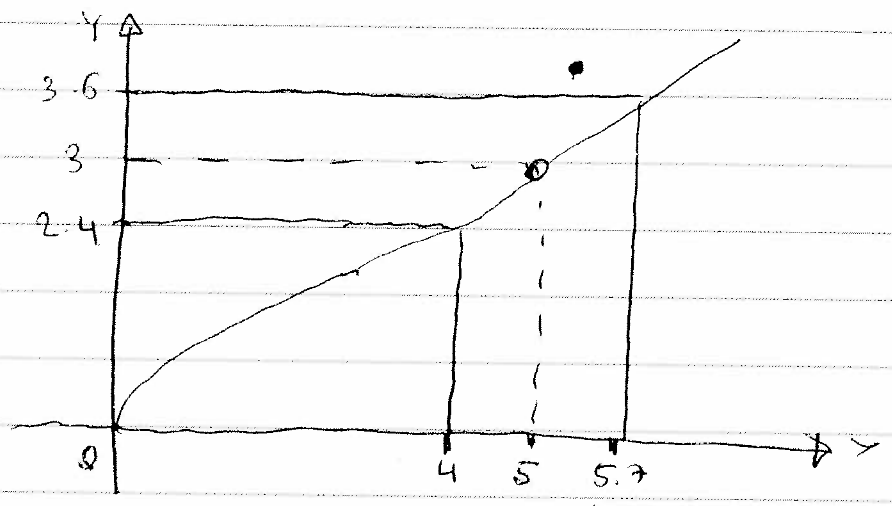
$x = 4$ on the left

$|x-5| < |4-5| = 1$

$x = 5.7$ on the right

$|x-5| < |5.7-5| = .7$

$\delta = 0.7$ or smaller



2.4 #15

We Love Math

Krystina
Jessica
Stephania

Section 2.4

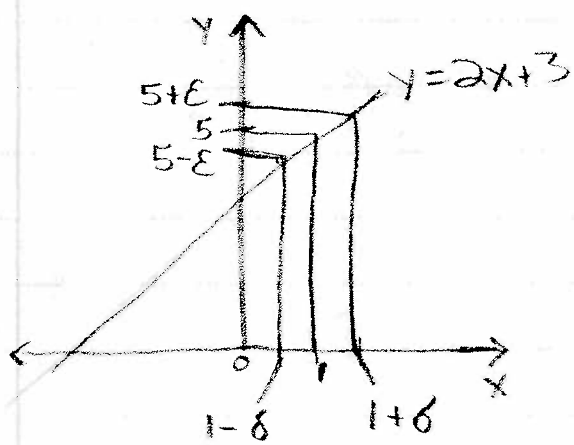
15. $\lim_{x \to 1} (2x+3) = 5$

If $0 < |x-1| < \delta$, then

$|(2x+3)-5| < \varepsilon \rightarrow |2x-2| < \varepsilon \rightarrow 2|x-1| < \varepsilon \rightarrow |x-1| < \varepsilon/2$

so if we choose $\delta = \varepsilon/2$, then $0 < |x-1| < \delta \rightarrow$
$|(2x+3)-5| < \varepsilon$.

By definition of a limit $\lim_{x \to 1} (2x+3) = 5$



2.4
#15a

Sal J.
Fabian Best

5x

$\lim_{x \to 2} (4 + 2x) = 6$

$|4 + 2x| - 6$

$|2x + 4 - 6| < \epsilon$

$|2x - 2| < \epsilon$

$2|x - 1| < \epsilon$

$|x - 1| < \frac{\epsilon}{2}$. $\delta < \epsilon/2$,,

2.4
#18

Team Kickass

2.4 #18

$$\lim_{x \to 4} (7-3x) = -5$$

$$|-3x+7-(-5)| < \varepsilon$$

$$|-3x+12| < \varepsilon$$

$$\frac{|-3||x-4|}{3} < \frac{\varepsilon}{3}$$

$$\delta < \frac{\varepsilon}{3}$$

2.4 #20

Science Buddies

#20 $\lim_{x\to 6}\left(\frac{x}{4}+3\right)=\frac{9}{2}$

$\left|\frac{x}{4}+3-\frac{9}{2}\right|<\varepsilon$

$\left|\frac{x}{4}+\left(\frac{6-9}{2}\right)\right|<\varepsilon$

$\left|\frac{x}{4}-\frac{3}{2}\right|<\varepsilon$

$\frac{1}{4}|x-6|<\varepsilon$

$|x-6|<4\varepsilon$ $\delta=4\varepsilon$

$=\frac{1}{4}|x-6|<\delta$

$\frac{1}{4}\cdot\delta$

$\frac{1}{4}\cdot 4\varepsilon$

(2.4 #20) Letrice Wilgens Viviene   L. W. V.   02/8/10

2.4

20. $\lim_{x \to 6} \left(\frac{x}{4}+3\right) = \frac{9}{2}$

$0<|x-6|<\delta$ then $\left|\left(\frac{x}{4}+3\right)-\frac{9}{2}\right|<\varepsilon$

but $\left|\left(\frac{x}{4}+3\right)-\frac{9}{2}\right| \Rightarrow \frac{x}{4}+\left(\frac{3}{1}-\frac{9}{2}\right) = \left|\frac{x}{4}-\frac{3}{2}\right| = \left|\frac{1}{4}(x-6)\right| = \frac{1}{4}|x-6|$

$\frac{6-9}{2}=-\frac{3}{2}$

$4\ 0<|x-6|<\delta$ then $4 \times \frac{1}{4}|x-6| < \varepsilon \times 4$

if $0<|x-6|<\delta$ then $|x-6|<4\varepsilon$

that is if $0<|x-6|<\delta$

$\delta = 4\varepsilon$

Given $\varepsilon>0$; $\delta=4\varepsilon$. If $0<|x-6|<\delta$ then

$\left|\left(\frac{x}{4}+3\right)-\frac{9}{2}\right| = \left|\frac{x}{4}-\frac{3}{2}\right| = \frac{1}{4}|x-6| < \delta\frac{1}{4} = \frac{1}{4}(4\varepsilon) = \varepsilon$

Thus $0<|x-6|<\delta$ then $\left|\left(\frac{x}{4}+3\right)-\frac{9}{2}\right|<\varepsilon$

therefore, $\lim_{x \to 6} \left(\frac{x}{4}+3\right) = \frac{9}{2}$.

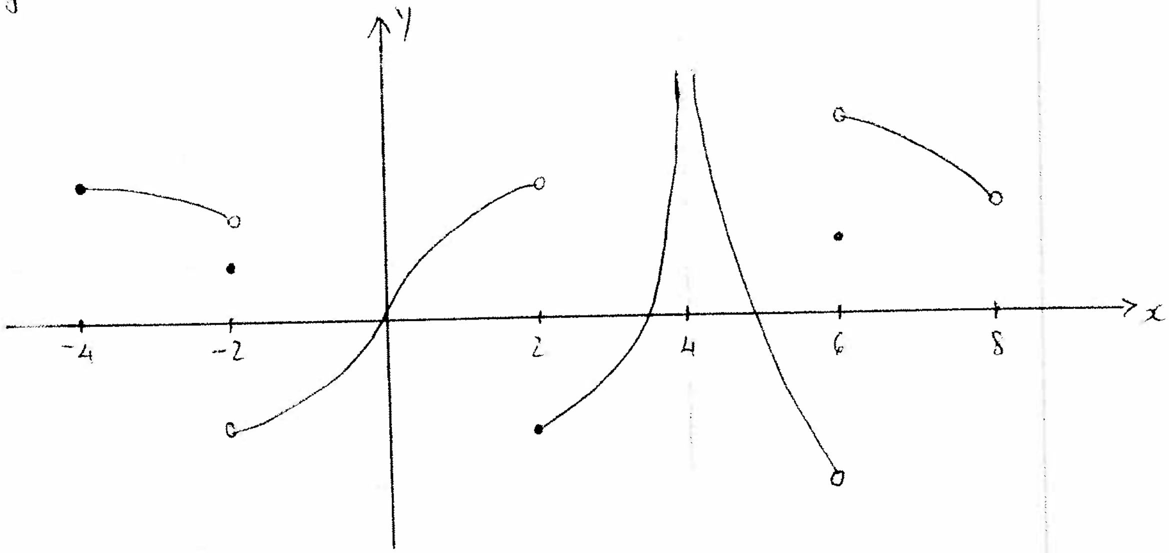
2.5 #4

HW H

2.5-4 | 128

Vinh Le
Ioan
Mike

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



g is continuous on $[-4, -2]$
$(-2, 2)$
$[2, 4)$
$(4, 6)$
$(6, 8)$

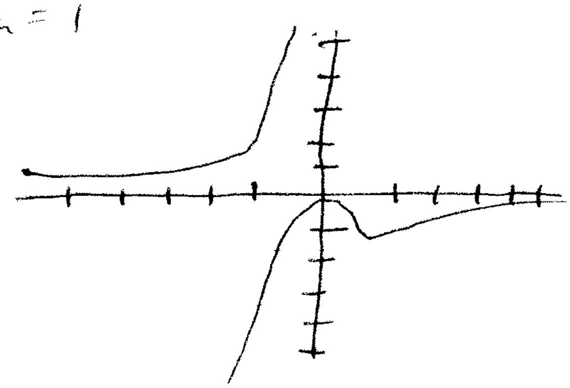
FR3CH

2.5 #12

Abe Espan
Yves Mosoule

THE GROUP - Section 2.5 #12 Feb. 8, 2010

#12 $h(t) = (2t - 3t^2) \div (1 + t^3)$, $a = 1$

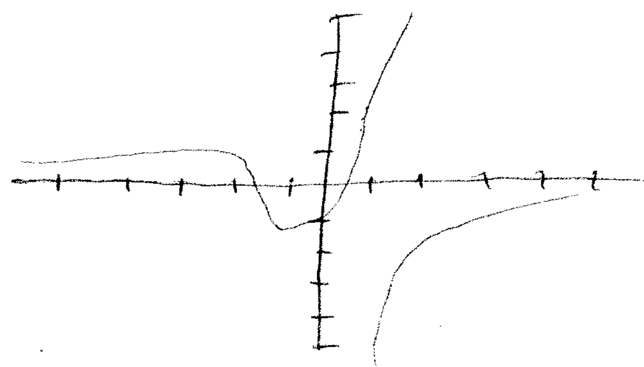


1. $f(a)$ is define ✓
2. $\lim_{x \to a} f(x)$ exist ✓
3. $\lim_{x \to a} f(x) = f(a)$ ✓

* polynomials is continous everywhere except where $1 + t^3 = 0$

↳ continous @ $a = 1$

#12a $h(t) = (8t + 5t^2) \div (3 - t^3)$, $a = 1$



1. $f(a)$ is define ×
2. $\lim_{x \to a} f(x)$ exist ×
3. $\lim_{x \to a} f(x) = f(a)$ ×

* polynomial is continous everywhere except where $3 - t^3 = 0$

Not continous @ $a = 1$

2.5
#13

2.5

13. $f(x) = \frac{2x+3}{x-2}$, $(2, \infty)$

1. f(a) is defined if $x \neq 2$

2. $\lim_{x \to a} f(a)$ exists if $x \neq 2$

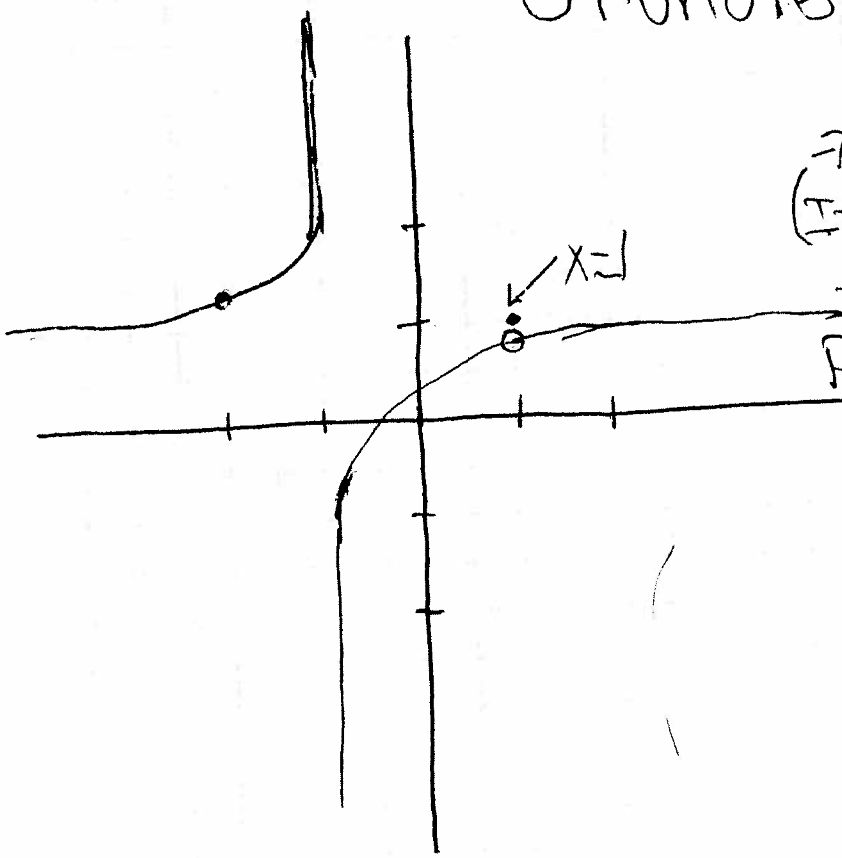
3. $\lim_{x \to a} f(x) = f(a)$

2.5 #18

$$f(x)=\begin{cases}\frac{x^2-x}{x^2-1} & \text{if } x\neq 1\\ 1 & \text{if } x=1\end{cases}$$

Grundle  's

(It is Suppose to be a Pumpkin)



With (1 if x=1) acting as a "plug", inputting 1 within

$$\frac{x^2-x}{x^2-1} = \frac{x(x-1)}{(x-1)(x+1)} = \frac{1}{(1+1)} = \frac{1}{2}$$ and

It would not "insert" into the missing plot

due to the fact that $\frac{1}{2} \neq 1$ So it is

Discontinuous.

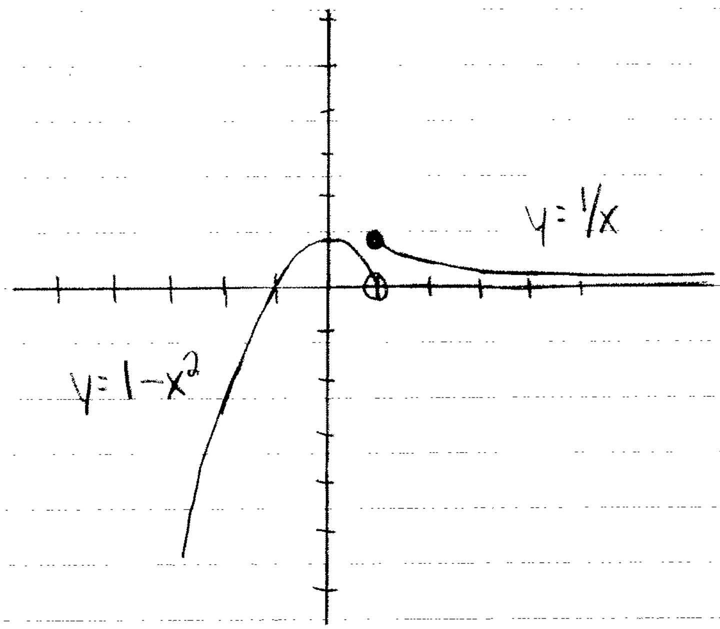
(2.5 #17)

Kristian Feher, Melva Avila, Jalisha Crews Save the Polar Bears

Mat: 151

HW: 2.4-2.5

2.5 #17. $f(x) = \begin{cases} 1-x^2 & \text{if } x<1 \\ 1/x & \text{if } x \geq 1 \end{cases}$ $a=1$ as $x \to a$...

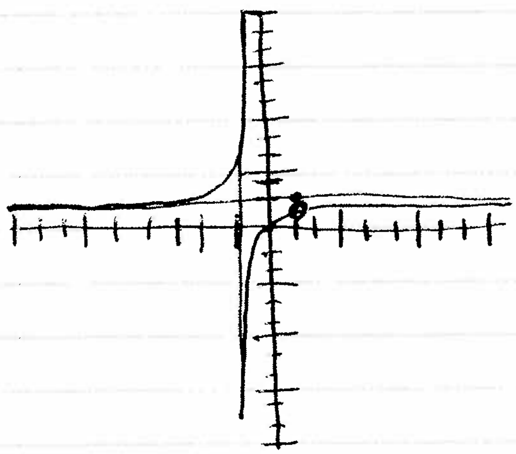


At a=1, f(x) is discontinuous because the limit of f(x) as x approaches a does not exist; this is due to differences in the left and right limit.

2.5
#18

Diesel

Connor Payne Tyler Ferst Stanley Tuchez



$$f(x) = \begin{cases} \frac{x^2 - x}{x^2 - 1} & \text{if } x \neq 1 \\ 1 & \text{if } x = 1 \end{cases} \qquad a = 1$$

It is discontinuous at $x = -1$ because there is an asymptote error.

It is discontinuous at $x = 1$ because $x \neq 1$ in y_1

$$\frac{x^2 - x}{x^2 - 1} = \frac{x(x-1)}{(x-1)(x+1)} = \frac{x}{x+1}$$

The function is discontinuous because there is a hole at $x = 1$ in the first function and the second function does not plug in the hole left by the first function because it is placed above it at the horizontal asymptote $y = 1$.

2.5 #35

Ryan ZHAO

Will Arbito

BA IS ~~AA~~ BS

$$f(x) = \begin{cases} x^2 & \text{if } x<1 \\ \sqrt{x} & \text{if } x \geq 1 \end{cases}$$

$$\lim_{x \to 1^-} f(x) = 1$$

$$\lim_{x \to 1^+} f(x) = 1$$

f(x) is continuous

Because the function meets the definition of Limit.

2.5
#37

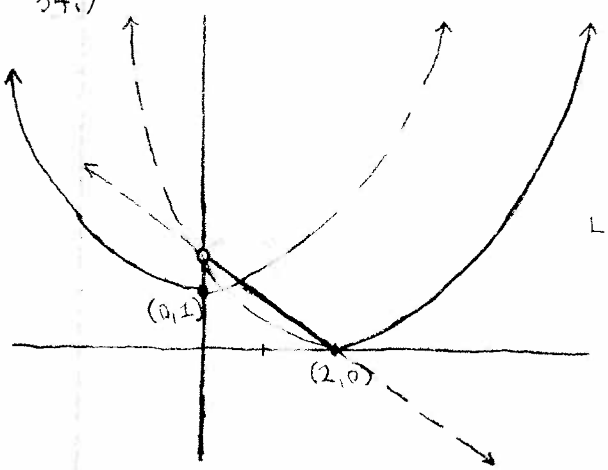
MAT151...

2.5 # 37

Team! α

Jonathan Chen
Guan Zheng
Mike Bank

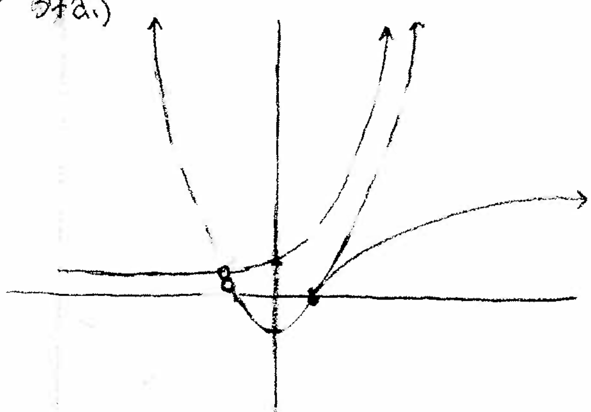
37.)



$$f(x) = \begin{cases} 1+x^2 & \text{if } x \le 0 \\ 2-x & \text{if } 0 < x \le 2 \\ (x-2)^2 & \text{if } x > 2 \end{cases}$$

└ f(x) is discontinuous at (0)... from the left.

✓ 37a.)



$$f(x) = \begin{cases} x^2-1 & \text{if } -1.315 < x \le 1 \\ \sqrt{x-1} & \text{if } x > 1 \\ e^{x+1} & \text{if } x < -1.315 \end{cases}$$

└ f(x) is discontinuous at -1.315 from the left (removable discontinuity)

2.5
#45

CIV.ARC
JASON KOHLHEPP
RYAN DSOUZA
STEPHEN MANCE

SECTION 2.5
PROB #45

45. IF $f(x) = x^2 + 10\sin x$, SHOW THAT THERE IS A NUMBER 'C' SUCH THAT $f(c) = 1000$

$$f(x) = x^2 + 10\sin x = 1000$$

$f(x)$ CONTINUOUS EVERYWHERE

$f(31) = 956$
$f(32) = 1029$

BY I.V.T. THERE IS A 'C'
$f(c) = 1000$ SO $c^2 + 10\sin c = 1000$

2.5
#47a

TEAM: C.A.M

47a.

$x^4 + x - 3 = 0$ (1,2)

$f(1) = (1)^4 + 1 - 3 = 0$

$1 + 1 - 3 = -1 < 0$

$f(2) = (2)^4 + 2 - 3 = 0$

$16 + 2 - 3 = 0$

$18 - 3 = 16 > 0$

polynomial or f

is continuous

everywhere