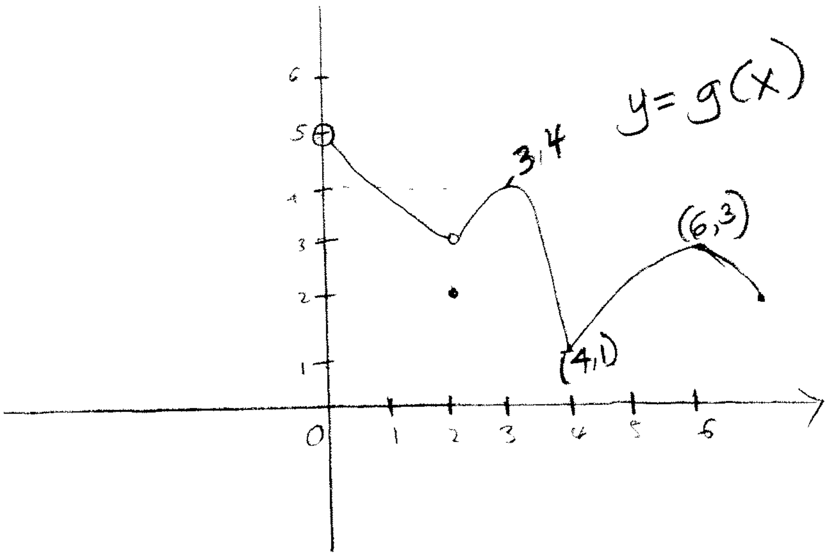
L W V.

3/24/2010

Q 4.1
\# 6.



Absolute Min $f(4) = 1$

Local minimum $f(3) = 4$

local Maximum $f(6) = 3$

Has no absolute Maximum.

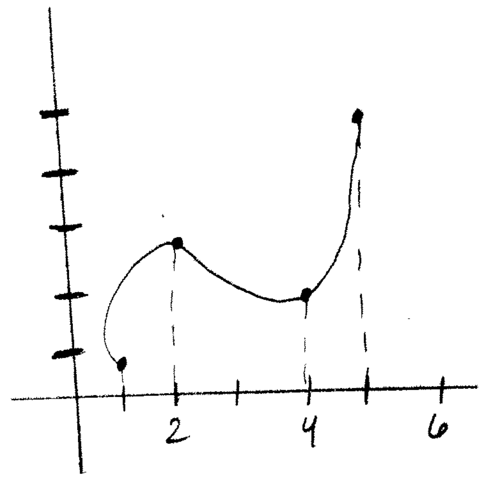
LWV

Letrice
Wilgens
Viviene

Fabian Best
Laquan Drummer
Sal Jahagirdar

[EMPIRE]

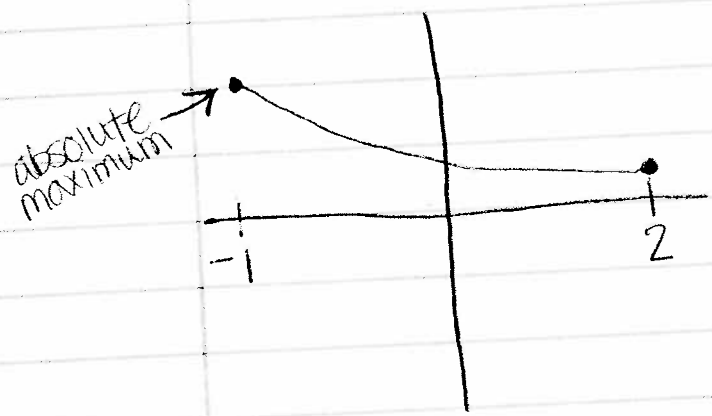
4.1 #8



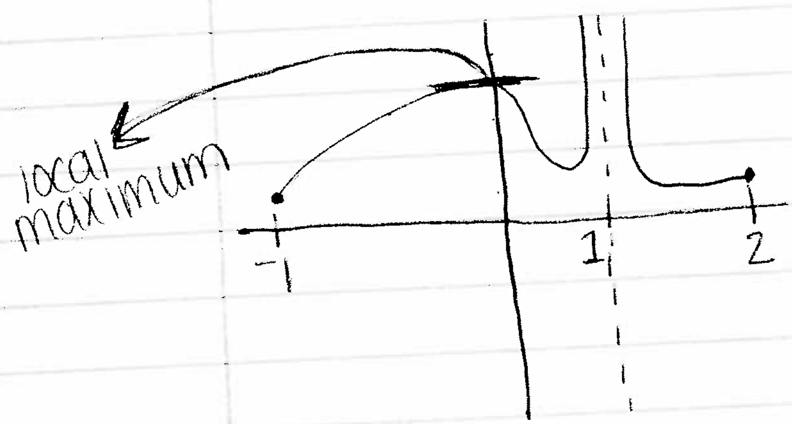
minimum = f(1)
maximum = f(5)
local max = x=2
local min = x=4

Team Kickass 4.1 #12

a. Sketch the graph of a function on [-1, 2] that has an absolute maximum but no local maximum.



b. Sketch the graph of a function on [-1, 2] that has a local maximum but no absolute maximum.



B.A is B.S
Will Arbito
Ryan Zhao

3/24/10

#22 $f(x) = 1 + (x+1)^2$

$f'(x) = 2(x+1)$

$f'(x) = 0 \quad x = -1 \quad f(-1) = 1$

$f(-2) = 2$

$f(5) = 37$

min = 1

may = 37

TEAM: C.A.M.

SECTION 4.1

#32

FIND THE CRITICAL NUMBERS

$f(x) = x^3 + x^2 + x$

$f'(x) = 3x^2 + 2x + 1$

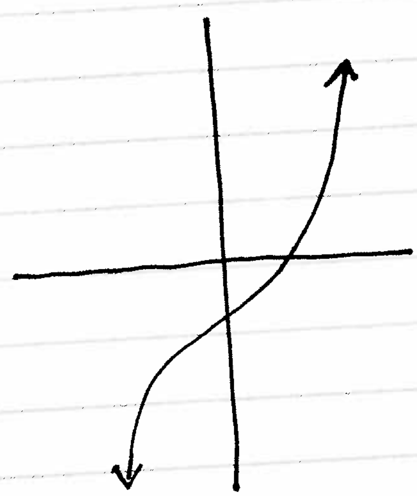
$b^2 - 4ac$

$\sqrt{D} = \sqrt{4 - 4 \cdot 3 \cdot 1} = \sqrt{-11}$

$f(0) = 3(0)^2 + 2(0) + 1$

$= 1$

SKETCH OF GRAPH:



THERE IS NO CRITICAL NUMBER

NO MAXIMUM OR MINIMUM

CASANDRA LUCERO
Augustin Crocotisan
(MAYA) KHOSBAYAR

4.1
#48

$f(x) = x^3 - 3x + 1$
$[0, 3]$

maximum : 3
minimum : 1

New Group

FR3CH

4.1 # 48

Find the absolute maximum and absolute minimum values of f on the given interval

$$f(x) = x^3 - 3x + 1 \quad , \quad [0, 3]$$

$$f'(x) = 3x^2 - 3$$

$$f'(x) = 0 \Leftrightarrow 3x^2 - 3 = 0$$

$$\Leftrightarrow \left[\begin{array}{l} x = -1 \\ x = 1 \end{array} \right.$$

$x = 0 \Rightarrow \cancel{y}\ f(x) = 1$

$x = 1 \Rightarrow f(x) = -1$

$x = 3 \Rightarrow f(x) = 19$

Absolute maximum value of f is 19 at $x = 3$

Absolute minimum value of f is -1 at $x = 1$

Grundle Pumpkins

4.1.50 $f(x)=x^3-6x^2+9x+2,[-1,4]$

SOLUTION: Since is continuous on [1,4], we can use the Closed Interval Method:

$f(x)=x^3-6x^2+9x+2$

$f'(x)=3x^2-6\bullet 2x+9=(3x-9)(x-1)$

Since *f'(x)* exists for all *x*, the only critical numbers of occur when *f'(x)=0*, that is,*x=1* or *x=3*. Notice that each of these critical numbers lies in the interval (1,4).

The values of at these critical numbers are
$f(1)=1^3-6\bullet 1^2+9\bullet 1+2=6$ $f(3)=3^3-6\bullet 3^2+9\bullet 3+2=2$

The values of at the endpoints of the interval are

$f(-1)=(-1)^3-6\bullet(-1)^2+9\bullet(-1)+2=-14$ $f(4)=4^3-6\bullet 4^2+9\bullet 4+2=6$

Comparing these four numbers, we see that the absolute maximum value is
$f(1)=f(4)=6$
and the absolute minimum value is $f(-1)=-14$

Sam Tobia

Pablo Espichan

Tiejun Wen

Save The Polar Bears : Kristion, Jalisha, Melva

#54. $f(x) = \dfrac{x^2-4}{x^2+4}$ $[-4,4]$ Use Quotient Rule!

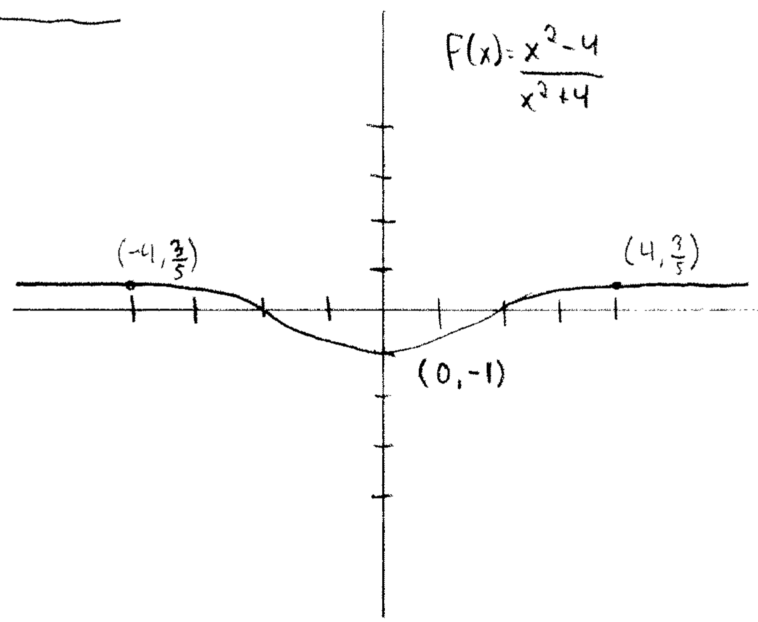
$$f'(x) = \frac{(x^2+4)\frac{d}{dx}(x^2-4) - (x^2-4)\frac{d}{dx}(x^2+4)}{(x^2+4)^2}$$

$$f'(x) = \frac{(x^2+4)(2x) - (x^2-4)(2x)}{(x^2+4)^2}$$

$$f'(x) = \frac{12x}{(x^2+4)^2}$$

$\downarrow$

$12x = 0 \quad \therefore \quad x = 0$



$$f(x) = \frac{x^2-4}{x^2+4}$$

$f(4) = \dfrac{(4)^2-4}{(4)^2+4}$ $f(-4) = \dfrac{(-4)^2-4}{(-4)^2+4}$ $f(0) = \dfrac{(0)^2-4}{(0)^2+4}$

$f(4) = \dfrac{12}{20}$ $f(-4) = \dfrac{12}{20}$ $f(0) = \dfrac{0-4}{0+4}$

$f(4) = \dfrac{3}{5}$ $f(-4) = \dfrac{3}{5}$ $f(0) = \dfrac{-4}{4} = -1$

absolute minimum $= -1$

absolute maximum $= \dfrac{3}{5}$

4.1 Science Buddies

#56 $f(t) = \sqrt[3]{t}\,(8-t),\ [0,8]$

$= t^{1/3}(8-t)$

① Use Product Rule to find y'

$$f'(t) = \frac{1}{3}t^{-2/3}(8-t) + (-1)\,t^{1/3}$$

$$f' = \frac{1}{3}t^{-2/3}(8-t) - t^{1/3}$$

$$f' = \frac{1}{3}(8-t)\,t^{-2/3} - t^{1/3}$$

$$f' = t^{-2/3}\left(\frac{1}{3}(8-t) - t\right) = 0$$

$\Rightarrow$ ② $t^{-2/3} = \boxed{0}$

$$\frac{1}{3}(8-t) - t = 0$$

$$\frac{8}{3} - \frac{1}{3}t - t = 0$$

$$-\frac{4}{3}t = -\frac{8}{3}$$

$$t = -\frac{8}{3} * \left(-\frac{3}{4}\right)$$

$$t = \boxed{2}$$

③ $f(t) = \sqrt[3]{t}\,(8-t)$

$f(0) = \sqrt[3]{0}\,(8-0) = \boxed{0}$

$f(8) = \sqrt[3]{8}\,(8-8) = \boxed{0}$

$f(2) = \sqrt[3]{2}\,(8-2) = \boxed{7.5}$

④ So maximum is $\boxed{7.5}$

minimum is $\boxed{0}$

= Answer

Yves Mosade

Section 4.1 #60

Abraham Egan

THE GROUP

+1

60) $f(x) = x - \ln x \qquad 1/2 \leq x \leq 2$

$f'(x) = 1 - 1/x$

$1 - 1/x = 0$

$-1/x = -1$

$x = 1$

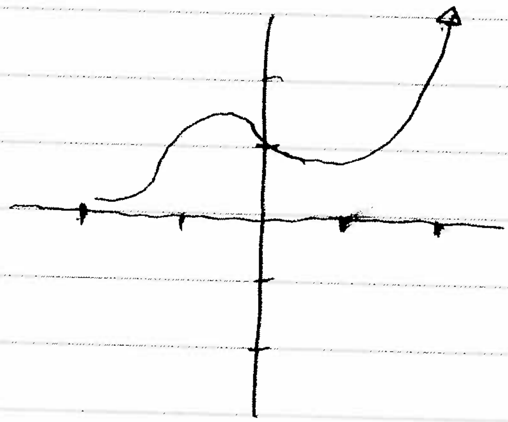
$f(1/2) = 1/2 - \ln 1/2 = 1.1931$

$f(2) = 2 - \ln 2 = 1.30685$ absolute maximum

$f(1) = 1 - \ln 1 = 1$ absolute minimum

Pythagorus

66. $f(x) = e^{x^3 - x}$. USE A GRAPH TO ESTIMATE ABSOLUTE MAX AND MIN



(a) absolute max = 1.469
absolute min = .68

(b). $f(x) = e^{x^3 - x}$ USE CALCULUS TO ESTIMATE ABSOLUTE MAX AND MIN

$$f' = e^{x^3 - x} \cdot \frac{d}{dx}(x^3 - x) = 0$$

$$3x^2 - 1 = 0$$

$$3x^2 = 1$$

$$x^2 = \frac{1}{3}$$

$$x = \pm\sqrt{\frac{1}{3}}$$

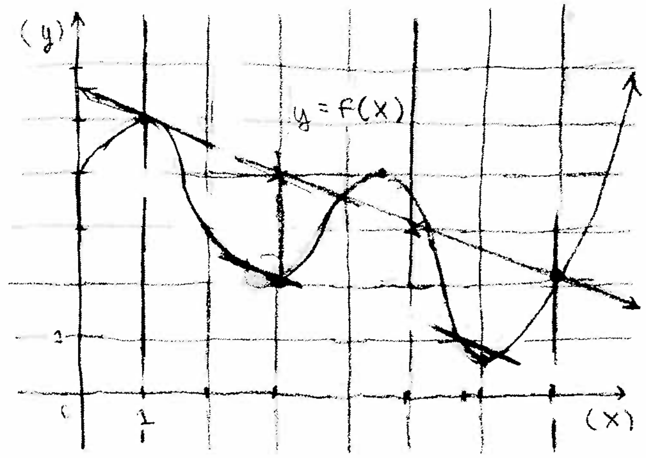
$$x = \pm\frac{1}{\sqrt{3}}$$

MAT151 ... Team: αC

3/23/10

4.2) #8

8.)



Use the graph of (f) to estimate the values of (c) that satisfy the conclusion of the mean value theorem for the interval [1,7]

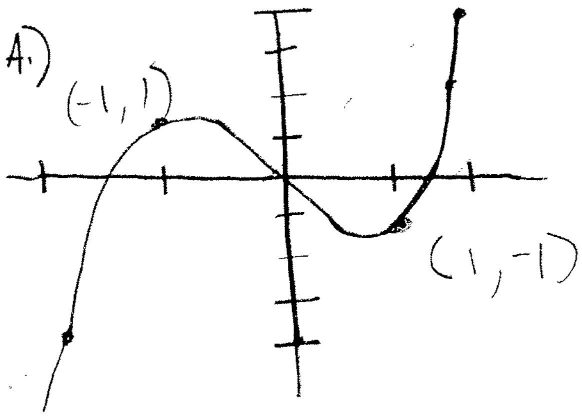
estimate: 2.8, 5.7

Jonathan Chen
Mike Gankhuyag

CIVARC
4.2 #10

Ryan

A.)



$f(x) = x^3 - 2x$

Team Dieses

Connor Payne
Stanley Tuchez
Tyler Ferst

Section 4.2

Verify that the function satisfies the hypothesis of the Mean Value Theorem on the given interval. Then find all #'s c that satisfy the conclusion of this theorem.

#12) $f(x) = x^3 + x - 1 \quad [0,2]$

$a = 0 \quad b = 2$

It is a polynomial, so it is continuous and differentiable for all x so it is continuous on the interval [0,2] and differentiable on (0,2) $\quad f(2) - f(0) = f'(c)(2 \cdot 0)$

$\frac{-1-a}{0-2} = \frac{-10}{-2} = 5 = c'$

$f(2) = 2^3 + (2) - 1$
$= 9$

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

$f'(x) = 3x^2$

$f(2) - f(0) = +10$

$10 = (3c^2+1) = 6c^2 + 2$

$10 = 6c^2 + 2$

$8 = 6c^2$

$4/3 = c^2$

$c = \pm \frac{2\sqrt{3}}{3}$

We Love Math

Stefania
Krystina
Jessica

14. $\cancel{4.2}$ $f(x) = \frac{x}{x+2}$ [1,4]

$f(4) = \frac{4}{4+2} = 4/6 = 2/3$
$f(1) = \frac{1}{1+2} = \frac{1}{3}$

$f'(x) = \frac{g(x)\,f'(x) - f(x)\,g'(x)}{[g(x)]^2}$

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

$f'(x) = \frac{2}{(x+2)^2}$

$\left(\frac{2}{3} - \frac{1}{3}\right) = \left(\frac{2}{(c+2)^2}\right)(4-1)$

$\frac{1}{3} = \left(\frac{2}{(c+2)^2}\right)(3)$

$\frac{1}{3} = \frac{6}{(c+2)^2}$

$\frac{1}{3} = \frac{6}{(c+2)^2}$

$(c+2)^2 = 18$
$(c+2) = \pm 4.24$
$c = 2.24$
-6.24