HW #13

Kristian, Julisha, Melva   SAVE DA POLAR BEARS

4.3

Use the given graph of f to find the following

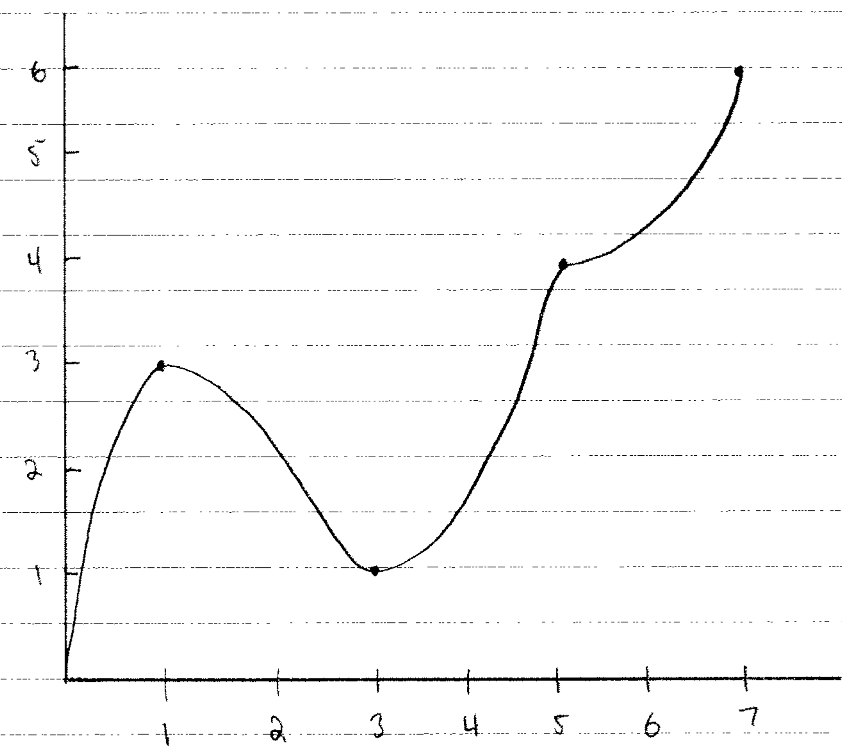
#2. a. (0,1), (3,5), (5,7)   Intervals where f is increasing.

b. (1,3)   Intervals where f is decreasing.

c. (2,5), (5,7)   Intervals on which f is concave upward.

d. (0,2)   Intervals on which f is concave downward.

e. (2,2),   Coordinates of the points of inflection.



4.3

Science Buddie

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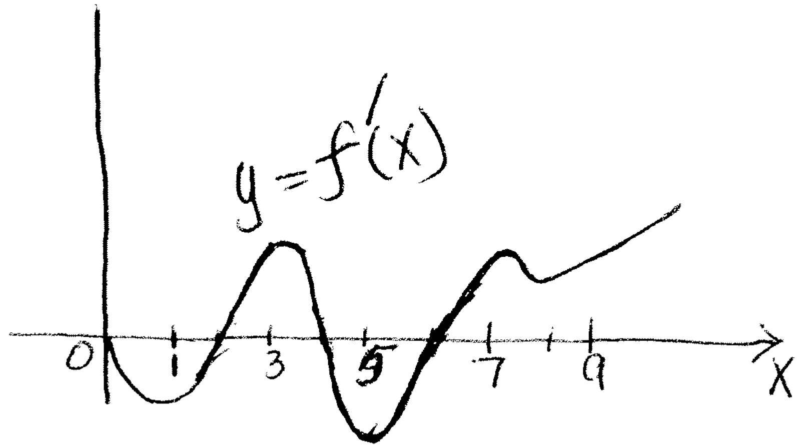


a) In which intervals increasing = $[2,4] \cup [6,9]$

b) local maximum = $[4]$

local minimum = $[6] \cup [2]$

c) concave Upward = $[1,3]$, $[5,7]$, $[8,9]$

concave Downward = $[0,1]$, $[3,5]$, $[7,8]$

d) x-coordinates of the inflection points of f? = 1, 3, 5, 7, 8

Section 4.3 #10

Abraham Eggen
THE GROUP

#10 $4x^3 + 3x^2 - 6x + 1$

$f'(x) = 12x^2 + 6x - 6$
$12x^2 + 6x - 6 = 0$
$6(2x^2 + x - 1) = 0$
$(2x - 1)(x + 1) = 0$
$x = -\frac{1}{2}, 1$

$f''(x) = 24x + 6$
$24x + 6 = 0$
$6(4x + 1) = 0$
$x = -\frac{1}{4}$

a. increasing @ 1
decreasing @ $-\frac{1}{2}, -\frac{1}{4}$

b. local maximum : -2
local minimum : .5

c. concavity : $(-\infty, -2)$ down
$(-.5, \infty)$ up

Pythogorus

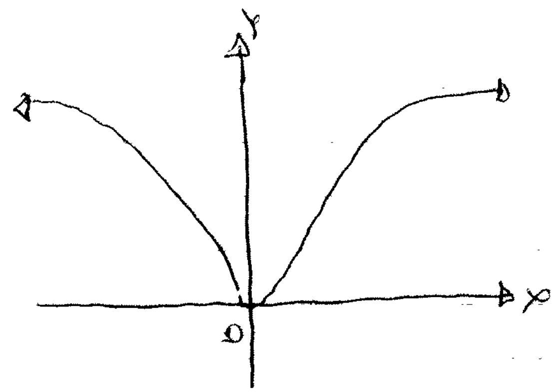
4.3 12. $f(x) = \frac{x^2}{x^2+3}$

a). $f'(x) = \frac{(x^2)'(x^2+3) + x^2(x^2+3)'}{(x^2+3)^2} = 2x(x^2+3) + x^2(2x)$

$= \frac{2x(2x^2+3)}{(x^2+3)^2}$ $\quad f'(x) = 0 \Rightarrow 2x(2x^2+3) = 0$

$x = 0$

$f(x)$	$-\infty$	0	$+\infty$
$f'(x)$	$-$	0	$+$
$f'(x)$	$\nearrow$	0	$\nearrow$



b) Local min $(0,0)$
Local max $(1.9, .55)$

(c) Intervals of concavity $(0,-\infty)$ down $\quad (0,\infty)$ up

The inflection points $= 0$

MAT151... Team α — 3/28/10

4.3) #20.

20.) Find the local max. & min. values of (f) using both the 1^{st} & 2^{nd} Derivative Tests:

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

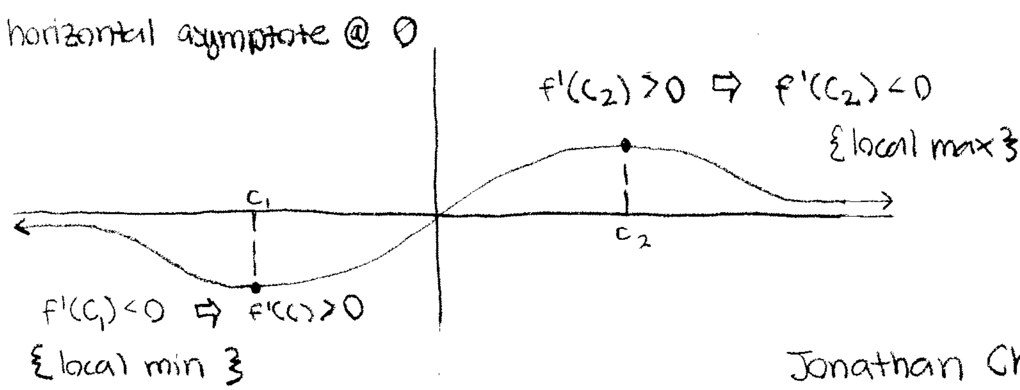
interval	x	x^2+4	$f'(x)$	f
$x<0$	$-$	$+$	$-$	dec. $(-\infty, 0)$
$0<x<4$	$+$	$+$	$+$	inc. $(0,4)$
$x>4$	$+$	$+$	$+$	inc. $(4,\infty)$

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

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

$$= \frac{(x^2+4) - 2x^2}{(x^2+4)^2} \Rightarrow f'(x) = 0$$

$$\boxed{f'(0) = 4/16 = 1/4}$$



Jonathan Chen

Mike Ganhuyag

SECTION 4.3
PROB #24

CIVARC
J. KOHLHEPP
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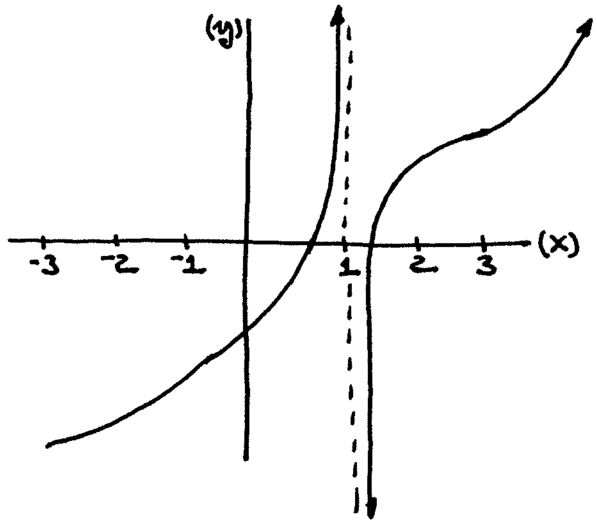
S. MANKE

24. SKETCH THE GRAPH OF A FUNCTION THAT SATISFIES ALL OF THE GIVEN CONDITIONS:

$f'(x) > \phi$ for all $x \neq 1$, VERTICAL ASYMPTOTE $x = 1$,
$f''(x) > \phi$ if $x < 1$ OR $x > 3$, $f''(x) < \phi$ if $1 < x < 3$.

GRAPH:



We Love Math

Section 4.3 #32

Krystina
Stephanie
Jessica

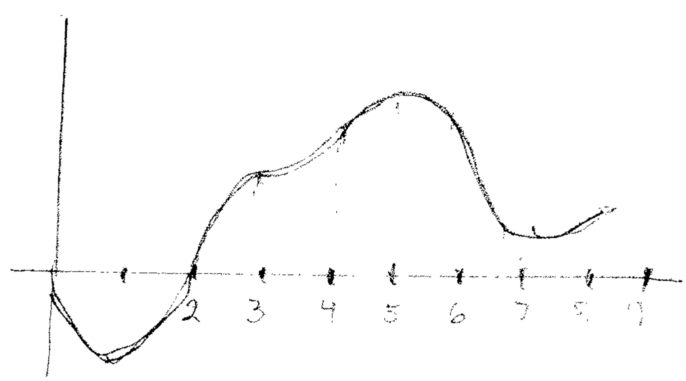
a. Increasing on (1,6) (8,∞)
Decreasing on (0,1) (6,8)

b. minimum at 1, 8
Maximum at 6

c. Concave up (0,2) (3,5) (7,∞)
Concave down (2,3) (5,7

d. 2, 3, 5, 7 nflection points

e.



Team Diesel

Connor Payne   Stanley Tucker   Tyler Ferst

On what intervals is f increasing or decreasing?

a) decreasing from $x=0$ to $x=1$
   increasing from $x=1$ to $x=6$
   decreasing from $x=6$ to $x=8$
   increasing from $x=8$ to $x=$ ↑

At what values of x does f have a local max/min?

b) local maximums = $x=2$, $x=5$
   local minimums = $x=3$, $x=7$

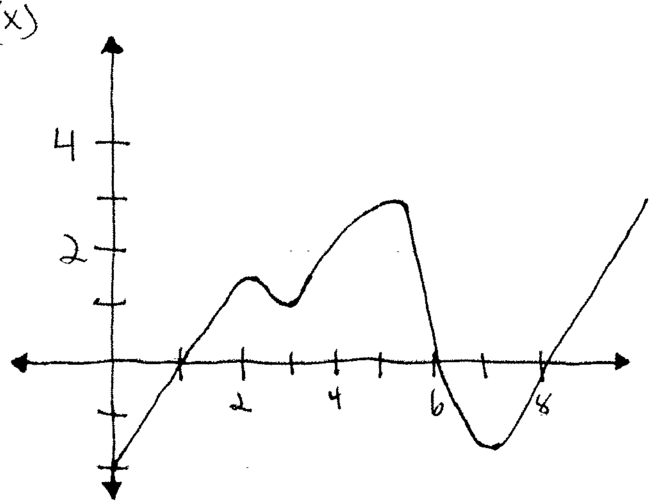
On what intervals is f concave upward/downward?

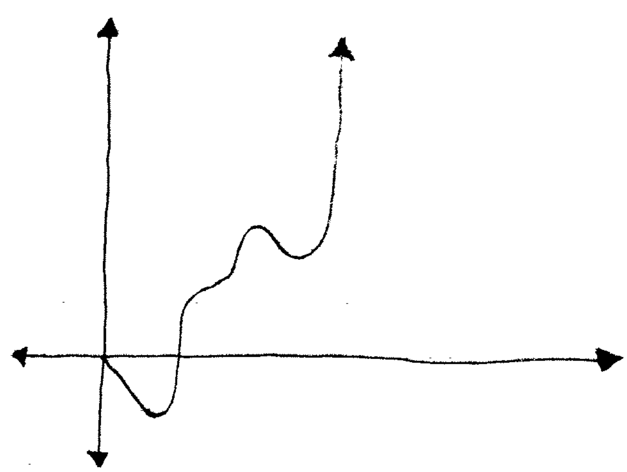
c) upward from $x=0$ to $x=2$
   downward from $x=2$ to $x=3$
   upward from $x=3$ to $x=5$
   downward from $x=5$ to $x=7$
   upward from $x=7$ to $x=9$*

d) State the x-coordinates of point(s) of inflection.
   between $x=2$ and $x=3$
   between $x=3$ and $x=4$
   between $x=5$ and $x=6$
   between $x=7$ and $x=8$

e) Assuming $f(0)=0$, sketch graph of f.

$f'(x)$





L·W·V
Letrice
Wilgens
Viviene

4·3
#34.

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

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

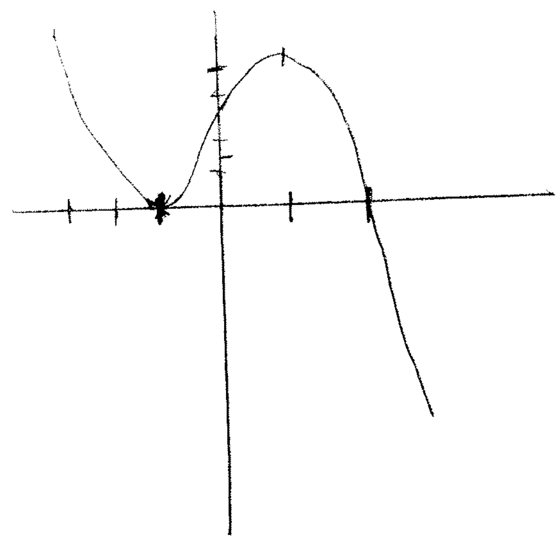
$f''(x) = -6x$

local min $= (-1,0)$

local max $= (1,4)$

$3(1-x)(1+x)=0$.

$1-x=0$ $\quad$ $1+x=0$
$-x=-1$ $\quad$ $\underline{x=-1}$
$\underline{x=1}$



$f(1) = 2+3(1)-1^3$
$= 2+3-1$
$= 5-1$
$= 4$.

$f'(1) = 3-3(1)^2$
$= 3-3$
$= 0$

$f'(-1) = 3-3(-1)^2$
$= 3-3$
$= 0$

$f''(-1) = -6(-1)$
$= 6$

$f''(1) = -6(1)$
$= -6$.

Team Empire Fabian Best

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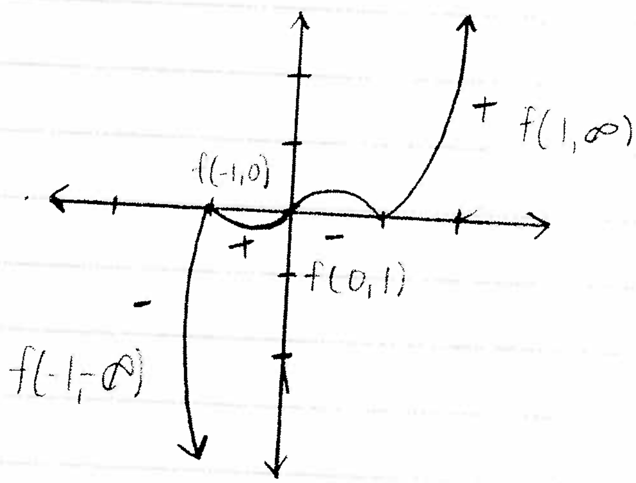

$h(x) = x^5 - 2x^3 + x$

minimum: f(-∞)
maximum: f(∞)
local max: .2844
local min: -.2844