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25) inc: $(-\infty,0)\cup(2,\infty)$
dec: $(0,2)$
rel max $(0,3)$ rel min $(2,-1)$
Concave up: $(1,\infty)$
Concave down: $(-\infty,1)$
inflection $(1,0)$
$+\ 0\ +$
$(-\infty,1)\cup(1,\infty)$

29) dec $(-\infty,-1)$
inc $(-1,0)\cup(0,\infty)$
rel max: none rel min $(-1,-1)$
Concave up: $(-\infty,-2/3)\cup(0,\infty)$
Concave down: $(-2/3,0)$
inflect $(-2/3,-\frac{16}{27})$ $(0,0)$

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22) inc $(-\infty,0)\cup(4,\infty)$
dec $(0,4)$
rel max $(0,15)$
rel min $(4,-17)$

35) inc: $(-\infty,-3)$ $(-3,0)$
dec $(0,3)\cup(3,\infty)$
rel max $(0,0)$

41) a) inc $(0,\frac{\pi}{4})$ $(\frac{5\pi}{4},2\pi)$
dec $(\frac{\pi}{4},\frac{5\pi}{4})$
b) rel max $(\frac{\pi}{4},\sqrt{2})$
rel min $(\frac{5\pi}{4},-\sqrt{2})$

62) a) inc $(-\infty,1)$
dec $(-1,\infty)$
b) rel max at $x=-1$

Oct 30-7:48 AM

Curve Sketching :

Review problem: Given the following information for the function: $y = x^4 + 4x^3$

Derivative: ______________________________

Increasing on (___ , ___) and (___ , ___)

Decreasing on (___ , ___)

Relative Minimum at (___ , ___)

Second Derivative: ______________________________

Concave Up on (___ , ___) and (___ , ___)

Concave Down on (___ , ___)

Points of Inflection at(___ , ___) and (___ , ___)

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54)

56)

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9) $c = \frac{2344}{729}$

16) c.v. $x=-1$
$+\ +$ $f'(x)$
-1
$(-\infty,\infty)$ inc

wksht

1) inc $(-\infty,-2)\cup(1,\infty)$
dec $(-2,1)$
rel max $(-2,20)$
rel min $(1,-7)$

4) concave down $(0,2\pi)$
no inflection

5a) $-2\sin(2x)$
b) $3\sec^2\sin(3x)\cos(3x)$
c) $\csc x\tan x\sec x - \sec x\sin x$

$f(x) = \sin(\frac{1}{2}x)$
$f'(x) = \frac{1}{2}\cos(\frac{1}{2}x)$
$f''(x) = \frac{1}{2}(-\sin\frac{1}{2}x)\frac{1}{2}$
$f''(x) = -\frac{1}{4}\sin\frac{1}{2}x$
I $(\frac{1}{2}x)$ D $\frac{1}{2}$
$-4(-\frac{1}{4}\sin\frac{1}{2}x) = 0\cdot -4$
$\sin\frac{1}{2}x = 0$
$\sin x = 0$
$0, \pi, 2\pi$
$2\cdot\frac{1}{2}x = 0\cdot 2$ $\frac{1}{2}x = \pi\cdot 2$ $\frac{1}{2}x = 2\pi$
$x = 2\pi$

dec: $(-\infty,-1)\cup(-1,1)\cup(1,\infty)$

$\tan(\sin(3x))$
$\sec^2(\sin(3x))\cos(3x)\cdot 3$

Nov 28-8:00 AM

For each problem find the x and y intercepts, open intervals where the function decreases and increases, inflection points, relative max, relative min, concave up and concave down. Then sketch the graph on graph paper

Ex1) $f(x) = -\frac{x^3}{3} + x^2$

x int

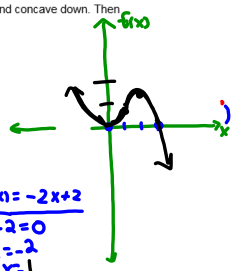
$3\cdot 0 = (-\frac{x^3}{3} + \frac{x^2}{1})3$
$0 = -x^3 + 3x^2$
$0 = x^2(-x+3)$
$(0,0)$
$(3,0)$

y int

$-\frac{0^3}{3} + 0^2 =$
$(0,0)$

$f'(x) = -x^2 + 2x$
$-x^2 + 2x = 0$
$x(-x+2) = 0$
$-\ 0\ +\ 0\ -$ $f'(x)$
$0 \quad 2$
dec $(-\infty,0)$ $(2,\infty)$
inc $(0,2)$
rel min $(0,0)$
rel max $(2,\frac{4}{3}) \rightarrow f(2) = -\frac{2^3}{3} + 2^2$
$-\frac{8}{3} + 4 =$

$f''(x) = -2x + 2$
$-2x + 2 = 0$
$-2x = -2$
$x = 1$
$+\ 0\ -$ $f''(x)$
1
inflection $(1,\frac{2}{3})$
$f(1) = -\frac{(1)^3}{3} + 1^2$
Concave up $(-\infty,1)$
Concave down $(1,\infty)$



Oct 30-7:46 AM

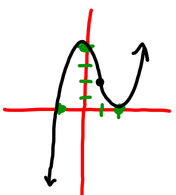
Ex 2) $f(x) = x^3 - 3x^2 + 4$

x int
$(-1,0)$ $(2,0)$

y int
$0^3 - 3(0)^2 + 4$
$(0,4)$

$f'(x) = 3x^2 - 6x$
$3x(x-2)$
$x=0$ $x=2$
$+\ 0\ -\ 0\ +$ $f'(x)$
$0 \quad 2$
inc $(-\infty,0)$ $(2,\infty)$
dec $(0,2)$
rel max $(0,4)$
$(2,0)$ rel min

$f''(x) = 6x - 6$
$-\ 0\ +$ $f''(x)$
$(1,2)$ concave down $(-\infty,1)$
up $(1,\infty)$
$(1,2)$



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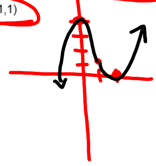
Ex3) Sketch the function which has the following characteristics

increasing $(-\infty,0)$ and $(2,\infty)$ concave down $(-\infty,1)$
decreasing $(0,2)$ relative max $(0,4)$
concave up $(1,\infty)$ relative min $(2,0)$
inflection point at $(1,1)$



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Ex4) Sketch the function which has the following characteristics

y-axis symmetry

horizontal asymptote at y=0

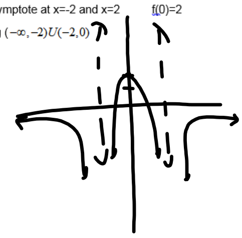
vertical asymptote at x=-2 and x=2

decreasing $(-\infty,-2)U(-2,0)$

concave up (-2,2)

concave down (-∞,-2)U(2,∞)

f(0)=2



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ex5)Sketch $y=\frac{7x^2-7}{x^3}$ include all parts from before

-5

Not doing! ☺

Oct 30-7:47 AM

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