Page 4

30) Using the graph of the position function find the approximate values at which v(t) = 0 and when a(t) = 0.

$v(t) = 0$

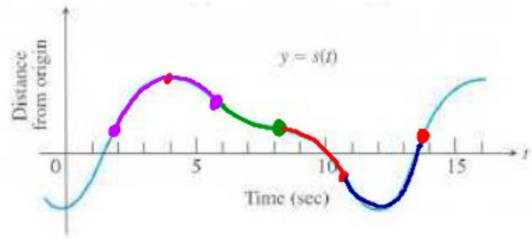
Horizontal tangents

$t = -.1, 4, 12, 16$

$a(t) = 0$

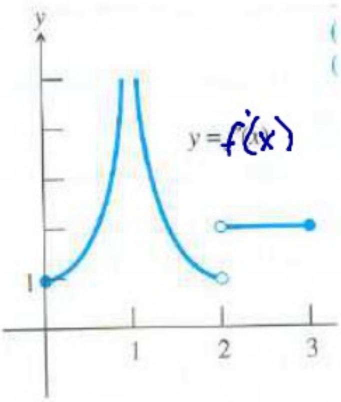
Changes in concavity

$t = 2, 6, 8, 11, 14$



50) Use the graph of the function f' to estimate the intervals on which
a) f is increasing b) f is decreasing c) f is concave up d) f is concave down
and then use the graph of the function f' to find
e) any extreme values and f) any points of inflection
(Assume that the function f is continuous from [0, 3])

No Interval
- Local Extremes



a) f inc $f' > 0$

$[0,1) \cup (1,2) \cup (2,3]$

b) never b/c f' never < 0

c) concave up $f'' > 0$ (slope $f' > 0$)

$(0,1)$

d) concave down $f'' < 0$ (slope $f' < 0$)

$(1,2)$

Extreme Values

Abs Min $x = 0$

Abs Max $x = 3$

b/c $f' > 0$ from $[0,3]$

Pts of Inflection

$x = 1$

What you'll Learn About:
How to sketch graphs of f(x), $f'(x)$, and $f''(x)$

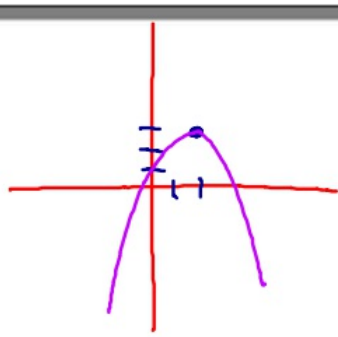
40a) $f(2) = 3$ Point (2,3)

x=2 Critical Pt
Possible Max/Min

$f'(2) = 0$

f increasing ← $f'(x) > 0$ for x< 2

f decreasing ← $f'(x) < 0$ for x> 2

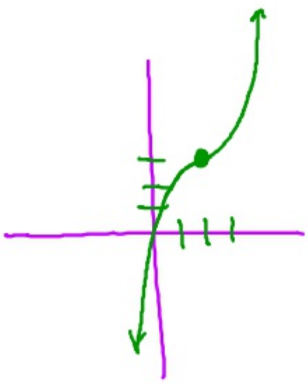


40d) $f(2) = 3$

$f'(2) = 0$

f inc except at x=2

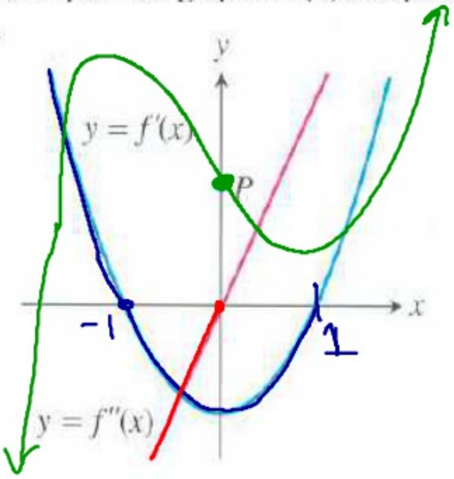
$f'(x) > 0$ for $x \neq 2$



What you'll Learn About:
How to sketch graphs of f(x), $f'(x)$, and $f''(x)$

Sketch a possible graph of f(x) that passes through point P

41.

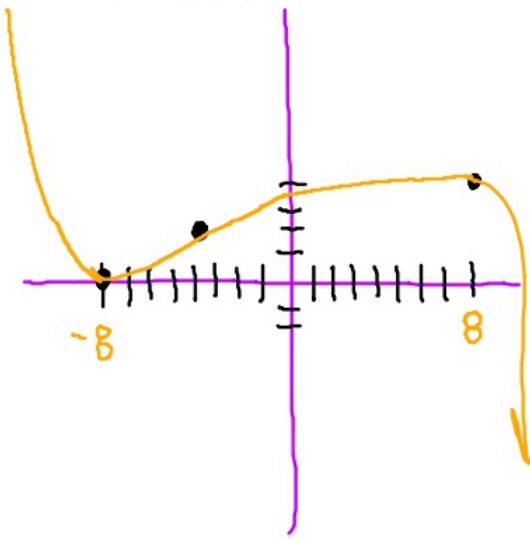


$x=0$ Inflection Pt
$(-\infty,0)$ f(x) concave down
$(0,\infty)$ f(x) concave up

$(-\infty,-1)$ f(x) inc
$(-1,1)$ f(x) dec
$(1,\infty)$ f(x) inc
$x=-1$ Local Max
$x=1$ Local Min

Sketch a continuous curve with the following properties f(x)

$f(-8)=0$
$f(-4)=2$
$f(8)=4$
$f'(8)=f'(-8)=0$
$f'(x)>0 \quad |x|<8$
$f'(x)<0 \quad |x|>8$
$f''(x)>0 \quad x<0$
$f''(x)<0 \quad x>0$



$x=\pm 8$ C.P.
$|x|<8$ f inc
$-8<x<8$
$|x|>8$ f dec
$x<-8$ or $x>8$
$(-\infty,-8)$ or $(8,\infty)$
f concave up $(-\infty,0)$
f concave down $(0,\infty)$