hw solutions
section 4.2

12. $f(1)=2$, $f'(x)>0$ on $(-\infty,1)\cup(1,\infty)$
and $f''(1)=0$

(b)

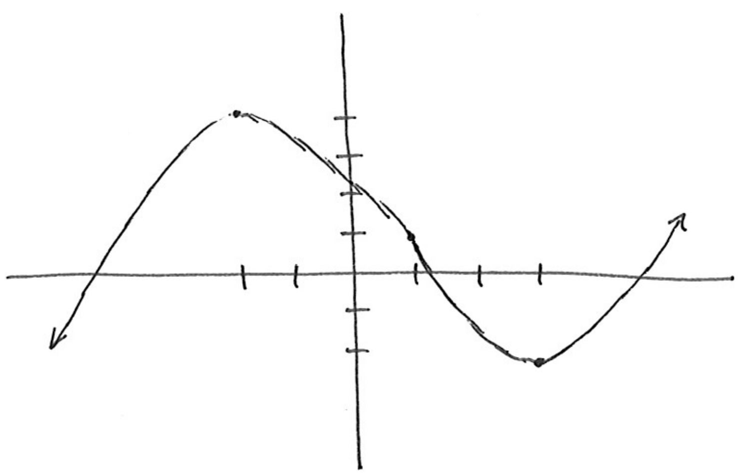
47. $f(x)=3x^4-4x^3+1$
find any inflection pts

$f'(x)=12x^3-12x^2$
$f''(x)=36x^2-24x$
$0=12x(3x-2)$
$x=0,\ 2/3$

$\overset{++}{\longleftarrow}\ 0\ \overset{--}{\longrightarrow}\ 2/3\ \overset{++}{\longrightarrow}$

inflection pts: $x=0,\ 2/3$

73. sketch the graph:
$f(-2)=4$, $f(3)=-2$
$f'(-2)=0$, $f'(3)=0$
$f'(x)>0$ on $(-\infty,-2)\cup(3,\infty)$
$f'(x)<0$ on $(-2,3)$
inflection pt at $(1,1)$



42. $f(x)=(x-2)^{2/3}$ find where f is CU/CD
$f'(x)=\frac{2}{3}(x-2)^{-1/3}$
$f''(x)=-\frac{2}{9}(x-2)^{-4/3}$
$f''(x)\neq 0$ but $f''(x)=$ dne when $x=2$

$\overset{--}{\longleftarrow}\ 2\ \overset{--}{\longrightarrow}$

CU : nowhere
CD : $(-\infty,2)\cup(2,\infty)$

62. $f(t)=2t+3/t$. find rel. max/min; use 2nd D. test

$f'(t)=2-3/t^2$
$0=2-3/t^2$
$2=3/t^2$
$t^2=3/2$
$t=\pm\sqrt{3/2}$
or $t=0$

$f''(t)=6/t^3$
$f''(0)=$ dne
$f''(\sqrt{3/2})>0$
$f''(-\sqrt{3/2})<0$

rel. max : $x=-\sqrt{3/2}$
rel. min : $x=\sqrt{3/2}$