Math 151 HW – Drawing a Graph from a Description

1) $f(-10)=20;\quad f(5)=-40$
$f'(-10)=f'(5)=0;$
$f'(x)>0$ if $-\infty<x<-10$ and $x>5;\quad f'(x)<0$ if $-10<x<5$

2) $f'(x)>0$ for all $x\neq 1;$ vertical asymptote $x=1$
$f''(x)>0$ if $x<1$ or $x>3;\ f''(x)<0$ if $1<x<3$

3) $f'(0)=f'(2)=f'(4)=0$
$f'(x)>0$ if $x<0$ or $2<x<4$
$f'(x)<0$ if $0<x<2$ or $x>4$
$f''(x)>0$ if $1<x<3,\ f''(x)<)$ if $x<1$ or $x>3$

4) $f'(1)=f'(-1)=0,\ f'(x)<0$ if $-1<x<1$
$f(-2)=f(1)=3;\ f(-1)=f(2)=7$
$f'(x)>0$ if $-2<x<-1$ or $1<x<2,\ f'(x)=-1$ if $x<-2$ or $x>2$
$f''(x)<0$ if $-2<x<0,$ inflection point $(0,1)$

5) $f'(x)>0$ if $-2<x<2,\ f'(x)<0$ if $x<-2$ or $x>2$
$f'(-2)=0,\ f'(2)$ is undefined; $f''(x)>0$ if $x\neq 2$

6) $f'(x)>0$ if $-10<x<10,\ f'(x)<0$ if $x<-10$ or $x>10$
$f'(10)=f'(-10)=0,\ \lim\limits_{x\to\infty} f(x)=20$ and $\lim\limits_{x\to -\infty} f(x)=20$
$f''(x)<0$ if $-15<x<15,\ f''(x)>0$ if $x<-15$ or $x>15$

7) $f'(x)<0$ and $f''(x)<0$ for all x