$f(x)=2x(x+1)^2$

1. Domain: $x\in R$
2. $Range: y\in R$
3. $f(-x)=-2x(-x+1)^2$, hence function is not even nor odd.
4. $\lim_{x\to\infty} f(x)=\infty, \lim_{x\to-\infty} f(x)=-\infty$.
5. $f'(x)=2(x+1)^2+4x(x+1)=0$, which has solutions $x=-1$ and $x=\frac{-1}{3}$. The signs of $f'(x)$ are as follows: $+-+$ for $(-\infty;-1),(-1;-\frac{1}{3}),(\frac{-1}{3};\infty)$ respectively, hence function is increasing, decreasing and increasing again on corresponding intervals. $x=-1$ Is local maximum and $x=\frac{-1}{3}$ is local minimum.
6. $f''(x)=4x+8(1+x)=0$, which has solutions $x=\frac{-2}{3}$ – this is the inflection point. For $x\in(-\infty,-\frac{2}{3})$, function is concave down and for $x\in(\frac{-2}{3},\infty)$ it is concave upward.
7. There are no horizontal and vertical asymptotes. Also there are no slant asymptotes.