1) b) critical points: $x=2, 5, 9, 11$, any pont between 11 and 14
   points of inflection: $x=3, 8$,
   c) discontinuous at $x=11$
   d) increasing: $x<2$, $5<x<9$
   decreasing $2<x<5$, $9<x<11$, $x>14$
   constant $11<x<14$
   concave up $3<x<8$
   concave down $x<3$, $8<x<11$, $x>14$

2) a) 30 exp(3x)
   b) $(10s(3s-2)-3(5s^2-1))/(3s-2)^2= (15s^2-20s+3)/(3s-2)^2$

3) $f'(w)=1/w$
   $f''(w)=-1/w^2$

4. a) Steady states: $x^*=(x^*)^2$
   $x^*=0$ and $x^*=1$
   stability: updating function $f(x)=x^2$
   $f'(x)=2x$
   $f'(0)=0$; $-1<f'(0)<1$, i.e. $x^*=0$ is stable
   $f'(1)=2$; $f'(1)>1$, i.e. $x^*=1$ is unstable
   b) The solution will get further away from 1 and closer to 0, without oscillations, so if we wait for a long time we will get close to $x(t)=0$

5) a) $M(V)=1.3V$
   $V(L)=2L^3$
   $L(T)=10+T/10$
   $M(T)=M(V(L(T)))$
   $M'(T)=M'(V)*V'(L)*L'(T)=1.3*6L^2*0.1=0.78(10+T/10)^2$

   b) $M'(T)>0$, i.e. the insect will be gaining weight

6) a) $s^*=0$
   b) $f'(x)=-0.8$, so $s^*=0$ is stable
   d) each time step the solution alternates between positive and negative value, with diminishing amplitude
   e)it will oscillate around zero, getting closer and closer to zero.

7) $w_{t+1}=2w_t/(2w_t+3(1-w_t))= 2w_t/(3-w_t)$ (missing condition: plants will descendants with the same color of flowers)