```
> restart;
```

```
> restart;
> x0:=h=m*w+(delta-w)*(si+sm);
```

$$x0 := h = m\,w + (\delta - w)\,(si + sm) \tag{1}$$

```
> x1:=subs(x0,h^alpha*(y-si)^(1-alpha));
```

$$x1 := \left(m\,w + (\delta - w)\,(si + sm)\right)^{\alpha}\,(y - si)^{1-\alpha} \tag{2}$$

```
> x2:=collect(simplify(isolate(diff(x1,si),si)),[sm,y]);
  sum('factor(op([2,i],%))','i'=1..3);
```

$$x2 := si = \frac{(-\delta + w + \alpha\,\delta - \alpha\,w)\,sm}{\delta - w} + \frac{(\alpha\,\delta - \alpha\,w)\,y}{\delta - w} + \frac{-m\,w + \alpha\,m\,w}{\delta - w}$$

$$sm\,(-1 + \alpha) + \alpha\,y + \frac{m\,w\,(-1 + \alpha)}{\delta - w} \tag{3}$$

```
> x3:=subs(si=sm,w=wm,x2);
  sum('factor(op([2,i],%))','i'=1..3);
  x3a:=sm=solve(x3,sm);
```

$$x3 := sm = \frac{(-\delta + wm + \alpha\,\delta - \alpha\,wm)\,sm}{\delta - wm} + \frac{(\alpha\,\delta - \alpha\,wm)\,y}{\delta - wm} + \frac{-m\,wm + \alpha\,m\,wm}{\delta - wm}$$

$$sm\,(-1 + \alpha) + \alpha\,y + \frac{m\,wm\,(-1 + \alpha)}{\delta - wm}$$

$$x3a := sm = -\frac{\alpha\,\delta\,y - \alpha\,wm\,y - m\,wm + \alpha\,m\,wm}{(\delta - wm)\,(-2 + \alpha)} \tag{4}$$

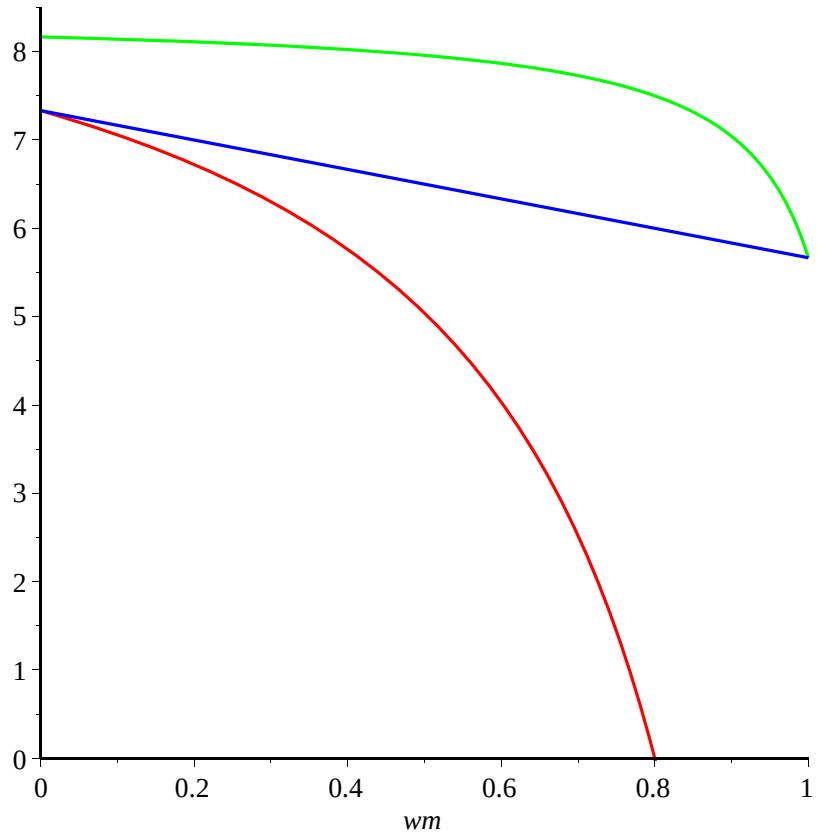
```
> factor(simplify(subs(x3a,subs(x2,x0))));
```

$$h = \frac{1}{(\delta - wm)\,(-2 + \alpha)}\Big(\alpha\,\big(-2\,m\,w\,\delta + m\,w\,wm + 2\,\delta\,w\,y + 2\,\delta\,y\,wm - 2\,w\,y\,wm + \delta\,m\,wm + \delta\,\alpha\,m\,w - \delta\,\alpha\,m\,wm - 2\,\delta^2\,y\big)\Big) \tag{5}$$

```
> x4:=subs(delta=1.1,m=15,y=10,alpha=.5,simplify(subs(x3a,subs(x2,
  subs(x0,h)))));
```

$$x4 := -\frac{0.3333333333\,(-2.75\,w - 5\,w\,wm + 30.25\,wm - 24.20)}{1.1 - wm} \tag{6}$$

```
> plot([subs(w=0,x4),subs(w=1,x4),(1-wm)*subs(w=0,x4)+wm*subs(w=1,
  x4)],wm=0..1,color=[red,green,blue],view=[0..1,0..8.5]);
```


8
7
6
5
4
3
2
1
0
0
0.2
0.4
0.6
0.8
1
wm