In[8]:=
```
g[y_] := -100 + 20 (k^2 - k l + l^2) y + 4 (k^2 - k l + l^2)^2 y^2 + k^2 (k - 1)^2 l^2 y^3
```

In[10]:=
```
f[x_] := g[x / (k^2 - k l + l^2)]
```

In[31]:=
```
f[x]
```

Out[31]=
$$-100 + 20\,x + 4\,x^2 + \frac{k^2\,(k-1)^2\,l^2\,x^3}{\left(k^2 - k\,l + l^2\right)^3}$$

In[35]:=
```
Solve[-100 + 20 x + 4 x^2 + 0 x^3 == 0, x]
```

Out[35]=
$$\left\{\left\{x \to \frac{5}{2}\left(-1 - \sqrt{5}\right)\right\}, \left\{x \to \frac{5}{2}\left(-1 + \sqrt{5}\right)\right\}\right\}$$

In[52]:=
```
Solve[-100 + 20 x + 4 x^2 + u[1 / 2] x^3 == 0, x]
```

Out[52]=
$$\{\{x \to -15\}, \{x \to -15\}, \{x \to 3\}\}$$

In[53]:=
```
f2[x_] := -100 + 20 x + 4 x^2 + u x^3
u[t_] := (1 - t)^2 t^2 / (1 - t + t^2)^3
Simplify[u[t] - u[1 - t]]
Solve[u'[t] == 0, t]
u[1 / 2]
```

Out[55]=
$$0$$

Out[56]=
$$\left\{\{t \to -1\}, \{t \to 0\}, \left\{t \to \frac{1}{2}\right\}, \{t \to 1\}, \{t \to 2\}\right\}$$

Out[57]=
$$\frac{4}{27}$$

In[29]:=
```
Plot[u[t], {t, 0, 1}]
```

Out[29]=