14a. N-trivial case

In this case we can consider a single term, with h-3r=2j

In[ ]:=
```
Clear[f, r, p, h, j, nu]
F = f[t] × Phi[h, p, r, p] /. r → (h - 2 j) / 3
```

Out[ ]= $f[t]\times \text{Phi}\left[h,\ p,\ \frac{1}{3}(h-2\,j),\ p\right]$

First upward shift operator

In[ ]:=
```
sh[3, 1, F, subtriv]
ff = f[t] /. DSolve[% == 0, f[t], t]⟦1⟧
```

Out[ ]= $\frac{1}{36\times(1+p)}(6+h-2\,j+3\,p)\,\text{Phi}\left[3+h,\ 1+p,\ \frac{1}{3}\times(3+h-2\,j),\ 1+p\right]((h+j+3\,p)\,f[t]+3\,t\,f'[t])$

Out[ ]= $t^{\frac{1}{3}(-h-j-3\,p)}\,\mathbb{c}_1$

In[ ]:=
```
efeqt[h, p, r, f] /. {f[r, t] → ff, f^(0,ee_)[r, t] :→ D[ff, {t, ee}]} /. r → (h - 2 j) / 3 // Factor
```

Out[ ]= $\left\{\frac{1}{9}\times(6+h+j-3\,\text{nu}+3\,p)\times(6+h+j+3\,\text{nu}+3\,p)\,t^{-\frac{h}{3}-\frac{j}{3}-p}\,\mathbb{c}_1,\ 0\right\}$

Second upward shift operator

In[ ]:=
```
sh[-3, 1, F, subtriv]
ff = f[t] /. DSolve[% == 0, f[t], t]⟦1⟧
```

Out[ ]= $\frac{1}{36\times(1+p)}(h-2\,j-3\times(2+p))\,\text{Phi}\left[-3+h,\ 1+p,\ \frac{1}{3}\times(-3+h-2\,j),\ 1+p\right]((h+j-3\,p)\,f[t]-3\,t\,f'[t])$

Out[ ]= $t^{\frac{1}{3}(h+j-3\,p)}\,\mathbb{c}_1$

In[ ]:=
```
efeqt[h, p, r, f] /. {f[r, t] → ff, f^(0,ee_)[r, t] :→ D[ff, {t, ee}]} /. r → (h - 2 j) / 3 // Factor
```

Out[ ]= $\left\{\frac{1}{9}\times(-6+h+j-3\,\text{nu}-3\,p)\times(-6+h+j+3\,\text{nu}-3\,p)\,t^{\frac{h}{3}+\frac{j}{3}-p}\,\mathbb{c}_1,\ 0\right\}$