11c. Example

See (3.53)

In[ ]:=
```
Clear[j, nu]
ph = t^(2 + nu) Phi[2 j, 0, 0, 0]
```

Out[ ]= t^{2+nu} Phi[2 j, 0, 0, 0]

In[ ]:=
```
ph1 = sh[3, 1, ph, subab]
```

Out[ ]= $\frac{1}{2} \times (2 + j + nu)\, t^{2+nu}$ Phi[3 + 2 j, 1, 1, 1]

In[ ]:=
```
sh[-3, -1, ph1, subab]
```

Out[ ]= $-\frac{1}{8} \times \left(4 + 4\, j + j^2 - nu^2\right) t^{2+nu}$ Phi[2 j, 0, 0, 0]

In[ ]:= $th = \frac{1}{8} \left(nu^2 - (2 + j)^2\right)$

Out[ ]= $\frac{1}{8} \left(-(2 + j)^2 + nu^2\right)$

In[ ]:=
```
eR[CasZ, ph, subtriv] / ph // Simplify
```

Out[ ]= $-4 + \frac{j^2}{3} + nu^2$

In[ ]:=
```
eR[Dt3Z, ph, subtriv] / ph // Simplify
```

Out[ ]= $-\frac{1}{9} \times (3 + j) \times \left(36 - 12\, j + j^2 - 9\, nu^2\right)$

Here we used the routine **eR** defined in 11b.

We may also use that φ is a minimal vector, and apply Lemma 3.4.

In[ ]:=
```
sh[3, 1, ph, subab]
sh[-3, -1, %, subab]
f1 = % / ph
```

Out[ ]= $\frac{1}{2} \times (2 + j + nu)\, t^{2+nu}$ Phi[3 + 2 j, 1, 1, 1]

Out[ ]= $-\frac{1}{8} \times \left(4 + 4\, j + j^2 - nu^2\right) t^{2+nu}$ Phi[2 j, 0, 0, 0]

Out[ ]= $\frac{1}{8} \times \left(-4 - 4\, j - j^2 + nu^2\right)$

Now use iii) and iv) in Lemma 3.4.

In[ ]:=
```
m2 = (h ^ 2 / 3 + p ^ 2 + 2 h + 2 p) + 4 (p + 2) / (p + 1) f1 /. {h → 2 j, p → 0} // Simplify
m2 == ld2[j, nu]
```

Out[ ]= $-4 + \frac{j^2}{3} + nu^2$

Out[ ]= True

In[ ]:=
```
m3 =
 (1 / 9) h (h + 3 p + 12) (h - 3 p + 6) + 2 (p + 2) (h - 3 p + 6) (p + 1) ^ (-1) f1 /. {h → 2 j, p → 0} // Simplify
m3 == ld3[j, nu] // Simplify
```

Out[ ]= $-\frac{1}{9} \times (3 + j) \times (36 - 12 j + j^2 - 9 nu^2)$

Out[ ]= True