In[2596]:=
```
Text[Row[{" dt error for all Fnn"}]]
Fnndt = -(H^2 k^3 U w) dt^2 / (2 (3 + H^2 k^2))
```

Out[2596]= dt error for all Fnn

Out[2597]= $-\frac{dt^2\ H^2\ k^3\ U\ w}{2\ \left(3 + H^2\ k^2\right)}$

In[2598]:=
```
Text[Row[{" -Sqrt[g*H] < U < Sqrt[g*H]  "}]]
Fnn1FDdxdt = -1/2 (Sqrt[g H] k^2) dt * dx
Text[Row[{" U > Sqrt[g*H]  "}]]
Fnn1FDdxdt1 = -1/2 (k^2 U) dt dx
Text[Row[{" U< -Sqrt[g*H] "}]]
Fnn1FDdxdt2 = 1/2 k^2 U dt dx
```

Out[2598]= $-\text{Sqrt}[g*H] < U < \text{Sqrt}[g*H]$

Out[2599]= $-\frac{1}{2}\ dt\ dx\ \sqrt{g\ H}\ k^2$

Out[2600]= $U > \text{Sqrt}[g*H]$

Out[2601]= $-\frac{1}{2}\ dt\ dx\ k^2\ U$

Out[2602]= $U < -\text{Sqrt}[g*H]$

Out[2603]= $\frac{1}{2}\ dt\ dx\ k^2\ U$

In[2604]:=
```
Text[Row[{" -Sqrt[g*H] < U < Sqrt[g*H]  "}]]
Fnn2FDdxdt = -(i (27 k^3 + 9 H^2 k^5 + H^4 k^7) U dt)/(12 (3 + H^2 k^2)^2) dx^2
Text[Row[{" U > Sqrt[g*H]  "}]]
Fnn2FDdxdt1 = -(i (27 k^3 + 9 H^2 k^5 + H^4 k^7) U dt)/(12 (3 + H^2 k^2)^2) dx^2
Text[Row[{" U< -Sqrt[g*H] "}]]
Fnn2FDdxdt2 = -(i (27 k^3 + 9 H^2 k^5 + H^4 k^7) U dt)/(12 (3 + H^2 k^2)^2) dx^2
```

Out[2604]= $-\text{Sqrt}[g*H] < U < \text{Sqrt}[g*H]$

Out[2605]= $-\dfrac{i\, dt\, dx^2 \left(27\, k^3 + 9\, H^2\, k^5 + H^4\, k^7\right) U}{12 \left(3 + H^2\, k^2\right)^2}$

Out[2606]= $U > \text{Sqrt}[g*H]$

Out[2607]= $-\dfrac{i\, dt\, dx^2 \left(27\, k^3 + 9\, H^2\, k^5 + H^4\, k^7\right) U}{12 \left(3 + H^2\, k^2\right)^2}$

Out[2608]= $U< -\text{Sqrt}[g*H]$

Out[2609]= $-\dfrac{i\, dt\, dx^2 \left(27\, k^3 + 9\, H^2\, k^5 + H^4\, k^7\right) U}{12 \left(3 + H^2\, k^2\right)^2}$

In[2610]:=
```
Text[Row[{" -Sqrt[g*H] < U < Sqrt[g*H]  "}]]
Fnn2FEMdxdt = -(i (54 k^3 + 45 H^2 k^5 + 10 H^4 k^7) U dt)/(120 (3 + H^2 k^2)^2) dx^2
Text[Row[{" U > Sqrt[g*H]  "}]]
Fnn2FEMdxdt1 = -(i (54 k^3 + 45 H^2 k^5 + 10 H^4 k^7) U dt)/(120 (3 + H^2 k^2)^2) dx^2
Text[Row[{" U< -Sqrt[g*H] "}]]
Fnn2FEMdxdt2 = -(i (54 k^3 + 45 H^2 k^5 + 10 H^4 k^7) U dt)/(120 (3 + H^2 k^2)^2) dx^2
```

Out[2610]= $-\text{Sqrt}[g*H] < U < \text{Sqrt}[g*H]$

Out[2611]= $-\frac{i\, dt\, dx^2 \left(54\, k^3 + 45\, H^2\, k^5 + 10\, H^4\, k^7\right) U}{120 \left(3 + H^2\, k^2\right)^2}$

Out[2612]= $U > \text{Sqrt}[g*H]$

Out[2613]= $-\frac{i\, dt\, dx^2 \left(54\, k^3 + 45\, H^2\, k^5 + 10\, H^4\, k^7\right) U}{120 \left(3 + H^2\, k^2\right)^2}$

Out[2614]= $U < -\text{Sqrt}[g*H]$

Out[2615]= $-\frac{i\, dt\, dx^2 \left(54\, k^3 + 45\, H^2\, k^5 + 10\, H^4\, k^7\right) U}{120 \left(3 + H^2\, k^2\right)^2}$

In[2616]:=
```
Text[Row[{" -Sqrt[g*H] < U < Sqrt[g*H]  "}]]
Fnn3FDdxdt = -(1/12) (Sqrt[g H] k^4) dt dx^3
Text[Row[{" U > Sqrt[g*H]  "}]]
Fnn3FDdxdt1 = -(1/12) (k^4 U) dt dx^3
Text[Row[{" U< -Sqrt[g*H] "}]]
Fnn3FDdxdt2 = (1/12) k^4 U dt dx^3
```

Out[2616]= $-\text{Sqrt}[g*H] < U < \text{Sqrt}[g*H]$

Out[2617]= $-\frac{1}{12}\, dt\, dx^3 \sqrt{g\, H}\, k^4$

Out[2618]= $U > \text{Sqrt}[g*H]$

Out[2619]= $-\frac{1}{12}\, dt\, dx^3\, k^4\, U$

Out[2620]= $U < -\text{Sqrt}[g*H]$

Out[2621]= $\frac{1}{12}\, dt\, dx^3\, k^4\, U$