In[28]:=
```
NthDividedDiff[x0_, f0_, startindex_, endindex_] :=
 Module[{x = x0, f = f0, i = startindex, j = endindex, answer},
 If[i == j, Return[f[[i]]],
  answer =
       (NthDividedDiff[x, f, i + 1, j] - NthDividedDiff[x, f, i, j - 1])/(x[[j]] - x[[i]]);
  Return[answer]];];
NewtonDDPoly[x0_, f0_] :=
 Module[{x1 = x0, f = f0, n, NewtonPolynomial, k, j},
 n = Length[x1];
 NewtonPolynomial[y_] = 0;
 For[i = 1, i ≤ n, i++,
  Prod[y_] = 1;
  For[k = 1, k ≤ i - 1, k++, Prod[y_] = Prod[y]*(y - x1[[k]])];

     NewtonPolynomial[y_] = NewtonPolynomial[y] + NthDividedDiff[x1, f, 1, i]*Prod[y]];
 Return[NewtonPolynomial[y]];];
nodes = {0, 1, 3};
value = {1, 3, 55};
NewtonPoly[y_] = NewtonDDPoly[nodes, value]
NewtonPoly[y_] = Simplify[NewtonPoly[y]]
NewtonPoly[2]
```

Out[32]= $1 + 2\,y + 8\,(-1 + y)\,y$

Out[33]= $1 - 6\,y + 8\,y^2$

Out[34]= 21

In[35]:=
```
nodes = {1, 2, 4};
value = {1, 4, 8};
NewtonPoly[y_] = NewtonDDPoly[nodes, value]
NewtonPoly[y_] = Simplify[NewtonPoly[y]]
NewtonPoly[2]
```

Out[37]= $1 + 3\,(-1 + y) - \frac{1}{3}\,(-2 + y)\,(-1 + y)$

Out[38]= $-\frac{8}{3} + 4\,y - \frac{y^2}{3}$

Out[39]= 4