

```
(%i14) for j from 0 thru 3 do (
      vec: matrix([x[i+j]], [y[i+j]]),
      P: matrix([1, - d[i+j]/2^(i+j)], [ d[i+j]/2^(i+j), 1]),
      ovec: P.vec,
      x[i+j+1] : ovec[1,1],
      y[i+j+1] : ovec[2,1],
      print("x[i+",j+1,"]=") , disp(x[i+j+1], "           "),
      print("y[i+",j+1,"]=") , disp(y[i+j+1], "           ")
    );
```

$$\begin{aligned}
x[i+1] &= x_i - \frac{d_i y_i}{2^i} y[i+1] = y_i + \frac{d_i x_i}{2^i} x[i+2] = -2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \\
\frac{d_i y_i}{2^i} + x_i y[i+2] &= 2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + y_i + \frac{d_i x_i}{2^i} x[i+3] = -2^{-i-2} \left(2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + y_i + \frac{d_i x_i}{2^i} \right) \\
2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \frac{d_i y_i}{2^i} + x_i y[i+3] &= 2^{-i-2} \left(-2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \frac{d_i y_i}{2^i} + x_i \right) d_{i+2} + \\
2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + y_i + \frac{d_i x_i}{2^i} x[i+4] &= -2^{-i-3} \left(2^{-i-2} \left(-2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \frac{d_i y_i}{2^i} + x_i \right) d_{i+2} + \right. \\
2^{-i-2} \left(2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + y_i + \frac{d_i x_i}{2^i} \right) d_{i+2} - 2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \\
\frac{d_i y_i}{2^i} + x_i y[i+4] &= 2^{-i-3} \left(-2^{-i-2} \left(2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + y_i + \frac{d_i x_i}{2^i} \right) d_{i+2} - 2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \right. \\
2^{-i-2} \left(-2^{-i-1} \left(y_i + \frac{d_i x_i}{2^i} \right) d_{i+1} - \frac{d_i y_i}{2^i} + x_i \right) d_{i+2} + 2^{-i-1} \left(x_i - \frac{d_i y_i}{2^i} \right) d_{i+1} + \\
& y_i + \frac{d_i x_i}{2^i}
\end{aligned}$$

(%o14) done