```
> restart:
> read `/M/m/findrel_v2.7`:
> f := u(n+2) = (n+2)*((9*n+15)*u(n) - (6*n+28)*u(n+1))/(n+7)/(3*n+2);
```

$$f := u(n+2) = \frac{(n+2)\,((9\,n+15)\,u(n) - (6\,n+28)\,u(n+1))}{(n+7)\,(3\,n+2)}$$

```
> findrel(f, u(n), {[0,0,0,1], u(0) = 0, u(1) = 1});
```

$$u(n) = 3\,(-1)^n \left(-\frac{(n^2+3\,n+2)\,A001006(n)}{(n+4)\,(n+5)} - \frac{(n^2+3\,n-2)\,A001006(n+1)}{(n+4)\,(n+5)}\right), 1 \leq n$$

```
> Our_sequence_without_hg := rhs(%[1])/(-1)^n;
```

$$Our\_sequence\_without\_hg := -\frac{3\,(n^2+3\,n+2)\,A001006(n)}{(n+4)\,(n+5)} - \frac{3\,(n^2+3\,n-2)\,A001006(n+1)}{(n+4)\,(n+5)}$$

```
> for i to 2 do 'A001006'(n+1+i) = collect(A001006(n+1+i), A001006, factor) od;
```

$$A001006(n+2) = \frac{3\,(n+1)\,A001006(n)}{n+4} + \frac{(2\,n+5)\,A001006(n+1)}{n+4}$$

$$A001006(n+3) = \frac{3\,(2\,n+7)\,(n+1)\,A001006(n)}{(n+5)\,(n+4)} + \frac{(7\,n^2+42\,n+59)\,A001006(n+1)}{(n+5)\,(n+4)}$$

```
> result := collect(x*A001006(n+3) + y*A001006(n+1) + z*A001006(n), A001006, factor);
```

$$result := \frac{(6\,x\,n^2+27\,x\,n+21\,x+z\,n^2+9\,z\,n+20\,z)\,A001006(n)}{(n+5)\,(n+4)} + \frac{(7\,x\,n^2+42\,x\,n+59\,x+y\,n^2+9\,y\,n+20\,y)\,A001006(n+1)}{(n+5)\,(n+4)}$$

```
> solve({numer(coeff(result, A001006(n))) = -3*(n+2)*(n+1), numer(coeff(result, A001006(n+1))) = -3*(n^2+3*n-2)}, {x,y,z});
```

$$\left\{z = -\frac{3\,(2\,x\,n^2+9\,x\,n+7\,x+2+n^2+3\,n)}{n^2+9\,n+20}, y = -\frac{7\,x\,n^2+42\,x\,n+59\,x-6+3\,n^2+9\,n}{n^2+9\,n+20}, x = x\right\}$$

```
> assign(%);
> x := a*n+b;
```

$$x := a\,n+b$$

```
> rem(-3*(7*x*n^2+42*x*n+59*x-6+3*n^2+9*n), (9*n+n^2+20), n);
rem(-3*(2*x*n^2+9*x*n+7*x+2+n^2+3*n), (9*n+n^2+20), n);
```

$$(-324\,a+54+63\,b)\,n+198-1260\,a+243\,b$$

$$(-144\,a+18+27\,b)\,n+54-540\,a+99\,b$$

```
> solve({%, %%}, {a,b});
```

$$\{a = -1, b = -6\}$$

```
> assign(%);
> assign(('x','y','z') = (op(simplify([x,y,z]))));
> collect(x*A001006(n+3) + y*A001006(n+1) + z*A001006(n),
```

```
  A001006, factor):
> is(% = Our_sequence_without_hg); # recall that we only stripped
  off (-1)^n
```

$$true$$

And so, since A001006 is always integer, u(n) is the sum of products of integers:

```
> u(n) = (-1)^n*(x*'A001006(n+3)' + y*A001006(n+1) + z*A001006(n)
  ), n>=1;
```

$$u(n) = (-1)^n \left((-n-6)\, A001006(n+3) + (7\, n+18)\, A001006(n+1) + (6\, n + 6)\, A001006(n) \right), 1 \leq n$$

```
>
```