

```

[> # just a doodle
[> # 5 16 2017
[> for v from 1 to 20 by 5 do
  v + 1;
  end do;
                                     2
                                     7
                                     12
                                     17
(1)
[> rsolve(f(n) = -3 f(n - 1) - 2 f(n - 2), f(k))
      (2 f(0) + f(1)) (-1)^k + (-f(0) - f(1)) (-2)^k
(2)
[> f
                                     f
(3)
[> rsolve(h(w) = 8 · h(w - 1) - 6 · h(w - 2), h(i))
      ( -1/5 h(0) sqrt(10) + 1/2 h(0) + 1/20 h(1) sqrt(10) ) (4 + sqrt(10))^i + ( 1/5 h(0) sqrt(10) + 1/2 h(0)
      - 1/20 h(1) sqrt(10) ) (4 - sqrt(10))^i
(4)
[> # that is so cool
[> # We have no idea what that calculator just did.
[> h := rsolve(t(z) = t(z - 1) + t(z - 2), t(n));
h := ( 1/10 t(0) sqrt(5) + 1/2 t(0) - 1/5 t(1) sqrt(5) ) ( 1/2 - 1/2 sqrt(5) )^n + ( -1/10 t(0) sqrt(5)
      + 1/2 t(0) + 1/5 t(1) sqrt(5) ) ( 1/2 + 1/2 sqrt(5) )^n
(5)
[> # 1/2 + 1/2 · sqrt(5) is never exactly the golden ratio ;
                                     sqrt(5) is never exactly the golden ratio
(6)
[> rsolve( {f(n) = -3 f(n - 1) - 2 f(n - 2), f(1..2) = 1}, {f} )
      {f(n) = -3 (-1)^n + (-2)^n}
(7)
[> # this leads to the sequence
[> s := [1, 1, -5, 13, ...]
                                     s := [1, 1, -5, 13, ( ) .. ( ) ]
(8)
[> # an almost alternating sequence
[>

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