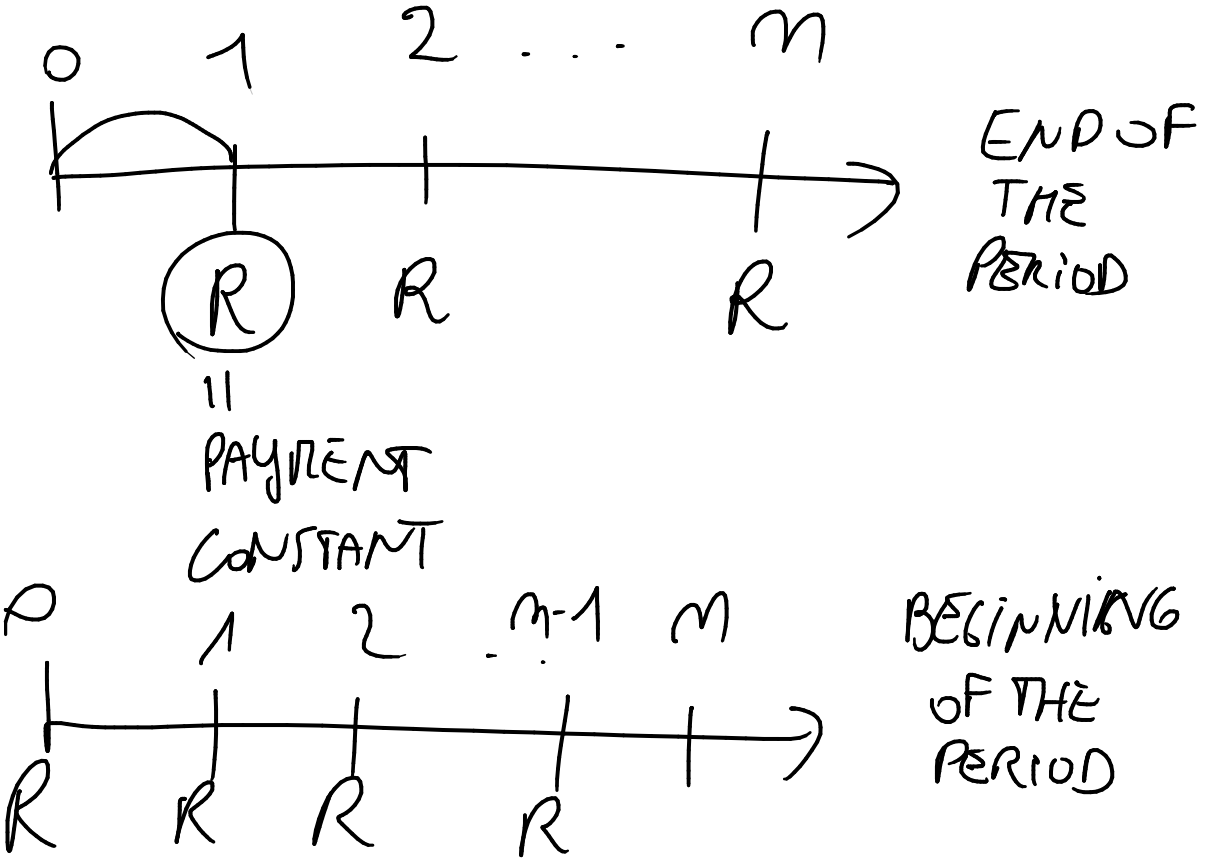
PAYment :

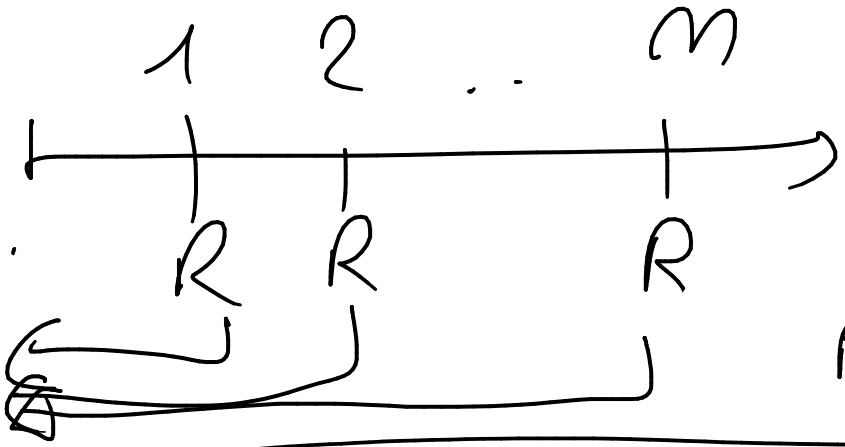
Present value :

FUTURE value :

ANNUITY


0
1
2 . . .
n
R
R
R
END OF THE PERIOD
11
PAYMENT CONSTANT
0
1
2
n-1
n
R
R
R
R
BEGINNING OF THE PERIOD

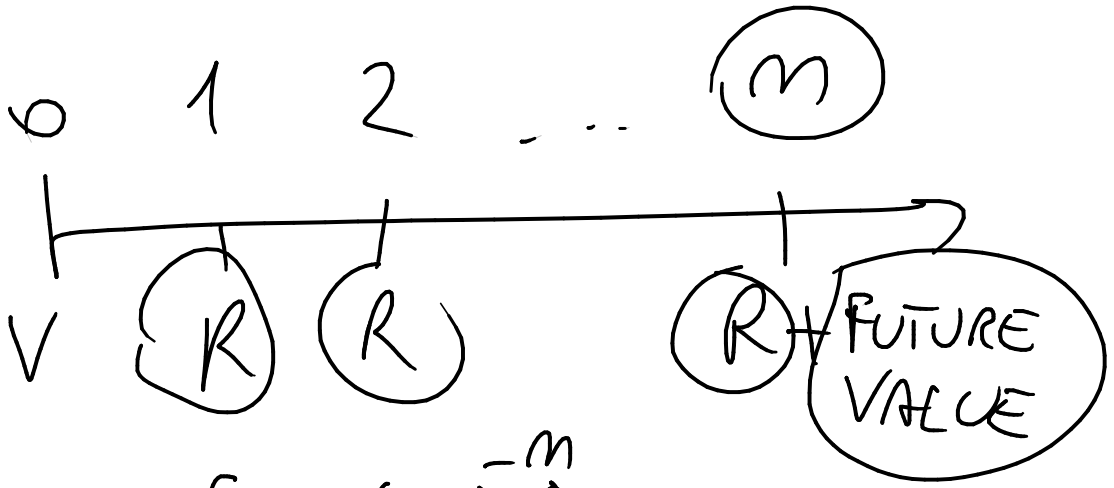
PRESENT VALUE :



$$PV = R\left[\frac{1-(1+i)^{-n}}{i}\right](1+i)$$

End of period

PRESENT VALUE:



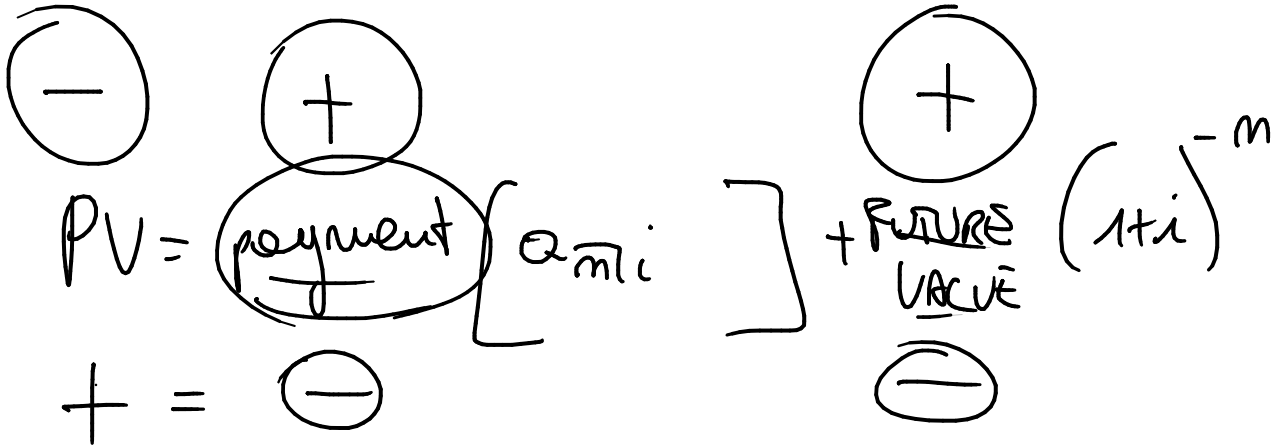
$$PV = R \cdot \left[\frac{1-(1+i)^{-n}}{i} \right] + \text{FUTURE VALUE}\,(1+i)^{-n}$$

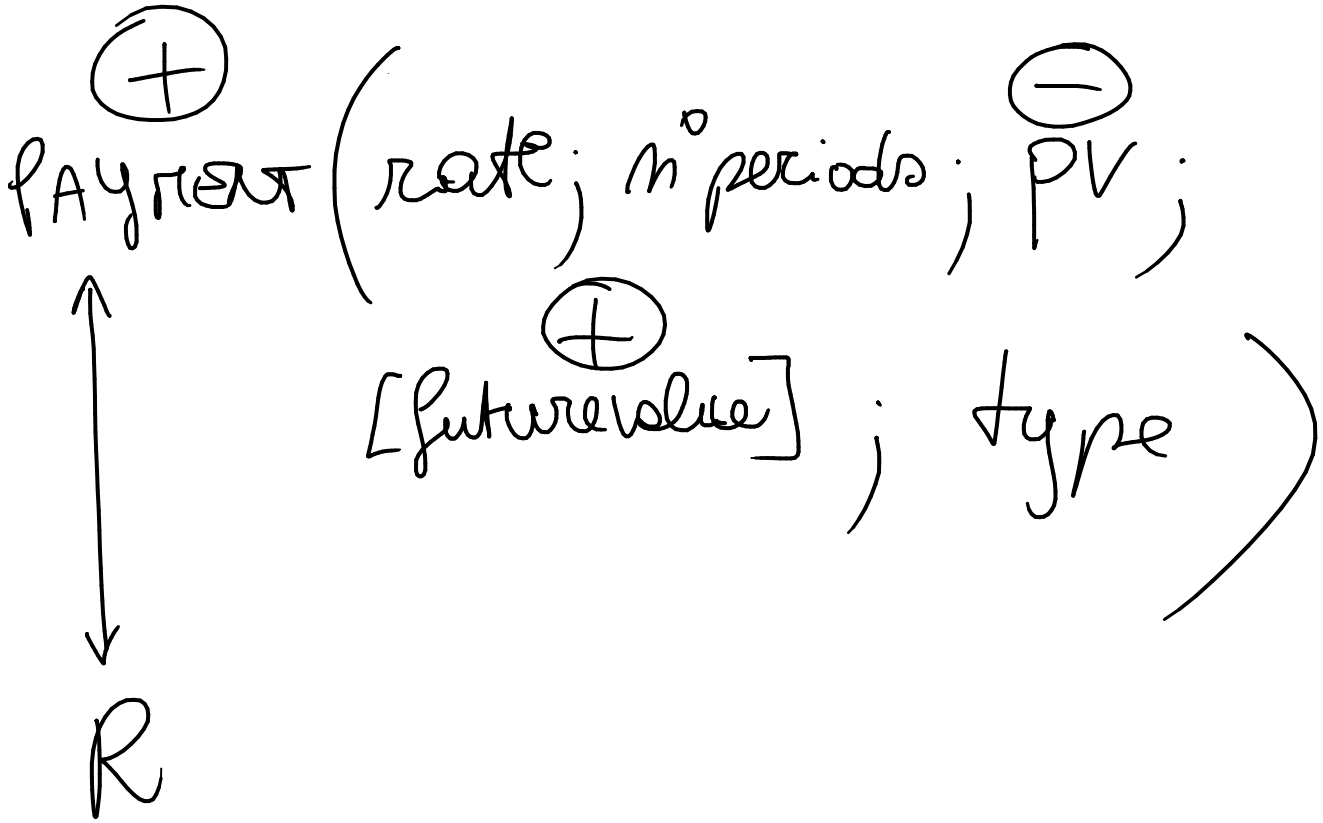
(+) (−) (−)

PV (rate ; n° periods ; payment ; [future value] ; type)

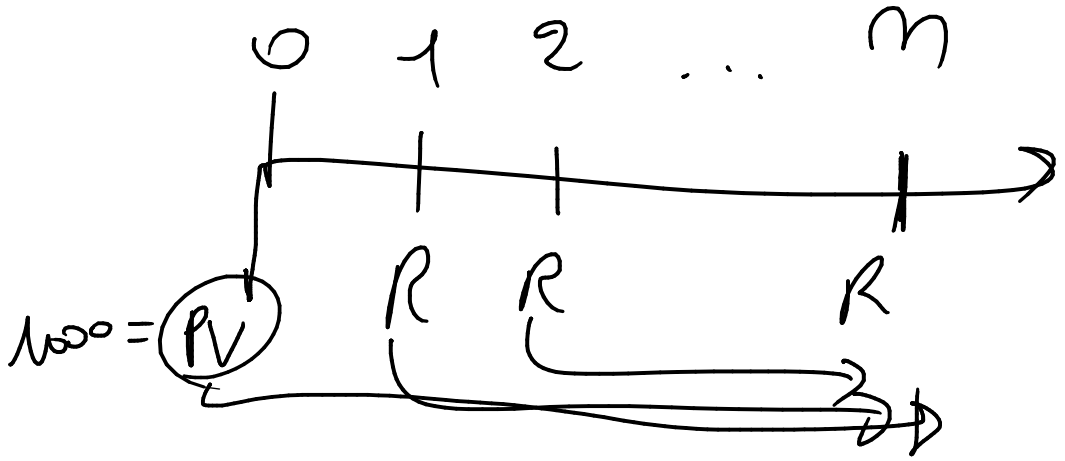
type → 0 or omitted = end of the period

1 = beginning of the period




+
PAYMENT
rate ; n° periods ;
−
PV ;
+
[future value] ; type
R

FUTURE VALUE

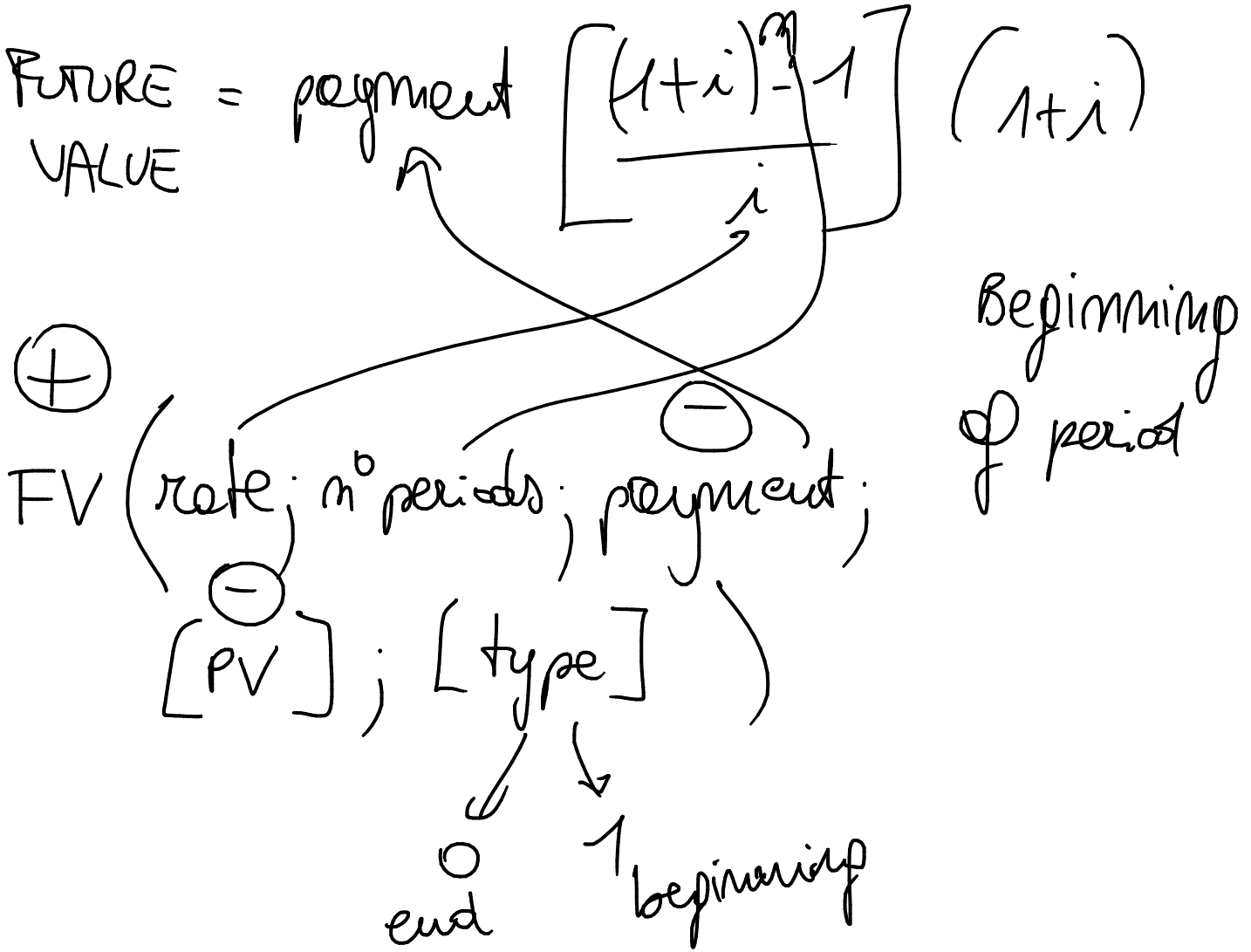


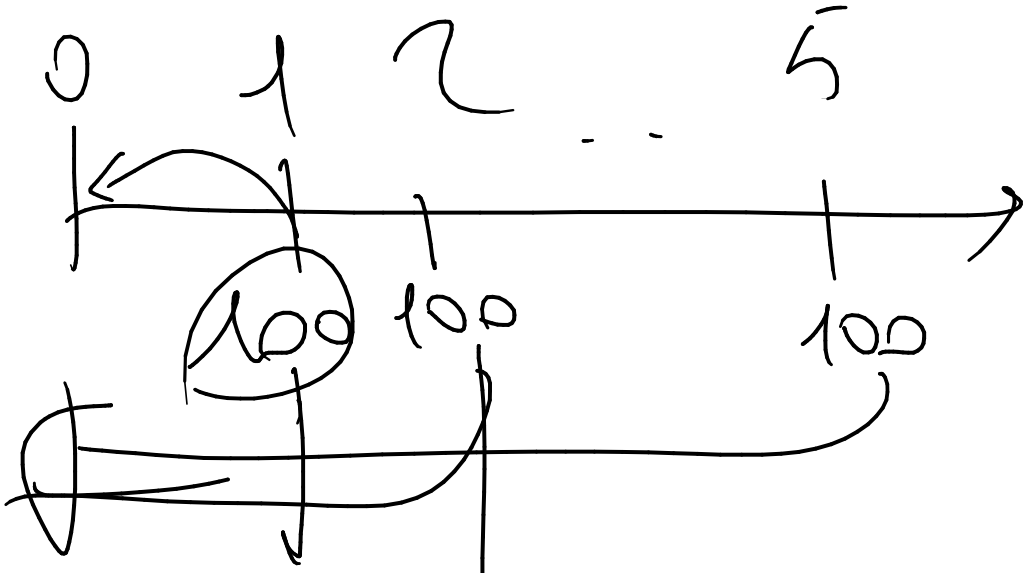
$$\text{FUTURE VALUE} = \text{Payment} \cdot \left[\frac{(1+i)^n - 1}{i}\right] + PV(1+i)^n$$

FUTURE VALUE: (+)

Payment: (−)

PV: (−)


FUTURE VALUE = payment [((1+i)^n - 1) / i] (1+i)
+
FV (rate ; nº periods ; payment ;
-
[PV] ; [type])
Beginning of period
0
end
1
beginning



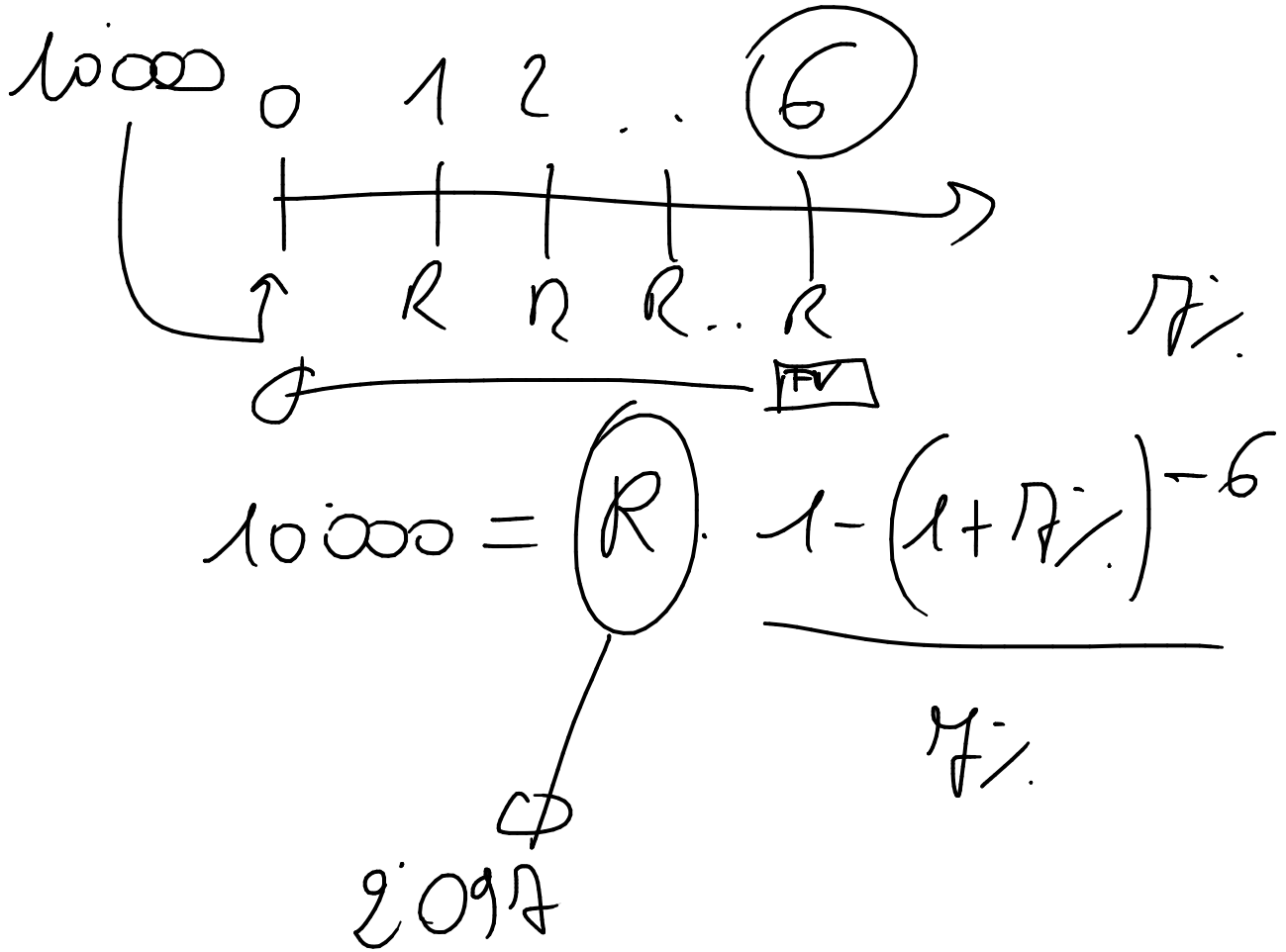
$$PV = \frac{100}{(1+i)} + \frac{100}{(1+i)^2} + \dots \frac{100}{(1+i)^5}$$

$$= 100 \left(\frac{1-(1+0,1)^{-5}}{0,1} \right)$$

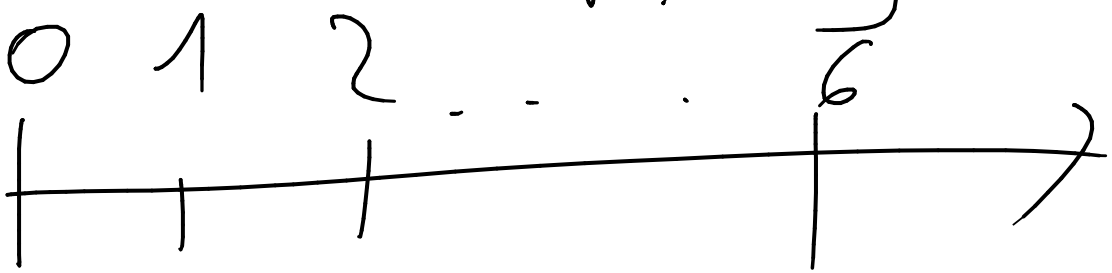
$$100 \cdot \left[\frac{1-(1+10\%)^{-10}}{10\%} \right] (1+10\%)$$

$$+ 100 \, (1+10\%)^{-10}$$

↓ future value


10000
0 1 2 .. 6
R R R .. R
7%
FV
10000 = R · 1 - (1+7%)^-6 / 7%
2097

$$10000 = R\left[\frac{1-(1+7\%)^{-6}}{7\%}\right] + 1000(1+7\%)^{-6}$$



$$PV = PMT(*) + FV(1+i)^{-n}$$

PV ⊖ PMT ⊕ FV ⊕