Ex 1

a) $C(n) = 300'000 \left(1 + \frac{1,5}{100}\right)^n = 300'000 \cdot 1,015^n$

b) 2012 → 2020 : 8 ans $C(8) = 300'000 \cdot 1,015^8 \approx 337'947,75$ frs

c) $300'000 \cdot 1,015^n = 400'000 \quad | : 300'000$

$1,015^n = \frac{4}{3} \quad | \log(\cdot)$

$\log(1,015^n) = \log(4/3)$

$n \cdot \log(1,015) = \log(4/3) \quad | : \log(1,015)$

$n = \frac{\log(4/3)}{\log(1,015)} \approx 19,32 \Rightarrow$ début 2032

d) $300'000 (1+i)^8 = 312'212,10 \quad | : 300'000$

$(1+i)^8 = \frac{312'212,10}{300'000} \quad | \sqrt[8]{\cdot}$

$1+i \approx 1,005 \quad | -1$

$i \approx 0,005 = 0,5\,\%$

Ex 2

$C(n) = 10'000 \left(1 + \frac{0,75}{100}\right)^{11} \approx 10'856,64$ frs

Ex 3

$10'730,40 = C_0 \cdot \left(1 + \frac{5,25}{100}\right)^7$

$10'730,40 = C_0 \cdot 1,0525^7 \quad | : (1,0525^7)$

$C_0 = \frac{10'730,40}{1,0525^7} \approx 7500$ frs

Ex 4

$40'000 = 20'000 (1+i)^{40} \quad | : 20'000$

$2 = (1+i)^{40} \quad | \sqrt[40]{\cdot}$

$1+i \approx 1,0175 \quad | -1$

$i \approx 0,0175 = 1,75\,\%$

Ex 5

$$1653 = C_0 \cdot \left(1 + \frac{0{,}75}{100}\right)^{13}$$

$$C_0 \cdot 1{,}0075^{13} = 1653 \quad | : (1{,}0075^{13})$$

$$C_0 = \frac{1653}{1{,}0075^{13}} \approx 1500 \text{ frs}$$

Ex 6

$$80'235 = 50'000 \left(1 + \frac{3}{100}\right)^{n}$$

$$50'000 \cdot 1{,}03^{n} = 80'235 \quad | : 50'000$$

$$1{,}03^{n} = 1{,}6047 \quad | \log(\cdot)$$

$$\log(1{,}03^{n}) = \log(1{,}6047)$$

$$n \cdot \log(1{,}03) = \log(1{,}6047) \quad | : \log(1{,}03)$$

$$n = \frac{\log(1{,}6047)}{\log(1{,}03)} \approx 16 \text{ ans}$$

Ex 7

$$20'000 \left(1 + \frac{1{,}25}{100}\right)^{5} \approx 21'281{,}64 \text{ frs}$$

$$21'281{,}64 \left(1 + \frac{1{,}5}{100}\right)^{12} \approx 25'444{,}72 \text{ frs}$$

$$25'444{,}72 \left(1 + \frac{1{,}75}{100}\right)^{3} \approx 26'804{,}10 \text{ frs}$$

Ex 8

$$5'812{,}40 = 4720 \left(1 + \frac{1{,}75}{100}\right)^{n} \quad | : 4720$$

$$1{,}0175^{n} \approx 1{,}23 \quad | \log(\cdot)$$

$$\log(1{,}0175^{n}) \approx \log(1{,}23)$$

$$n \cdot \log(1{,}0175) \approx \log(1{,}23) \quad | : \log(1{,}0175)$$

$$n \approx \frac{\log(1{,}23)}{\log(1{,}0175)} = 12 \quad \Rightarrow 12 \text{ ans avant } 2013$$

$$\Rightarrow 1^{er} \text{ janvier } 2001$$

Ex 9

Capital après 11 ans : $15'000\left(1+\frac{3}{100}\right)^{11} = 20763,5$

12e année : rapporte 3% de 20'763,5 : $\frac{3}{100}\cdot 20'763,5 = 622.90$ frs

Ex 10

Montant prévu : $70'000\left(1+\frac{2}{100}\right)^{10} \approx 85'329,61$

Montant après 5 ans : $70'000\left(1+\frac{2}{100}\right)^{5} \approx 77'285,66$

$77'285,66\left(1+\frac{1,25}{100}\right)^{n} = 85'329,61 \quad | : 77285,66$

$1,0125^{n} \approx 1,104 \quad | \log(\cdot)$

$\log\left(1,0125^{n}\right) = \log(1,104)$

$n\cdot\log(1,0125) = \log(1,104) \quad | : \log(1,0125)$

$n = \frac{\log(1,104)}{\log(1,0125)} \approx 8 \text{ ans} \quad \Rightarrow 5+8 = 13 \text{ ans}$

Ex 11

$C_n = C_0(1+i)^n$

$C_0 + 5'000 = C_0\left(1+\frac{3}{100}\right)^{10}$

$C_0 + 5'000 \approx 1,34\,C_0 \quad | - C_0$

$5'000 \approx 0,34\,C_0 \quad | : 0,34$

$C_0 \approx \frac{5'000}{0,34} \approx 14'538,40$ frs

Ex 12

$20'000(1+i)^{30} = 26'167.70 \quad | : 20'000$

$(1+i)^{30} \approx 1,308 \quad | \sqrt[30]{\cdot}$

$1+i \approx 1,009 \quad | -1$

$i = 0,009 = 0,9\,\%$

Ex 13

185,72 représente 4% du capital final

$\Rightarrow$ capital final : $\frac{185,72}{4} \cdot 100 = 4643.-$

$4643 = 2'900 \left(1 + \frac{4}{100}\right)^n$

$4643 = 2900 \cdot 1,04^n \quad | : 2900$

$1,04^n \approx 1,601 \quad | \log(\cdot)$

$\log(1,04^{\textcircled{n}}) \approx \log(1,601)$

$n \cdot \log(1,04) \approx \log(1,601) \quad | : \log(1,04)$

$n \approx \frac{\log(1,601)}{\log(1,04)} \approx 12$ ans