18

$a_1 = 100{,}000 - 2{,}000 = 98{,}000$

$a_2 = 98{,}000(1.03) - 2000$

$a_3 = \left[98{,}000(1.03)^2 - 2000(1.03)\right] - 2000$

$a_4 = \left[98{,}000(1.03)^3 - 2000(1.03)^2 - 2000(1.03)\right] - 2000$

$$a_n = 98000(1.03)^{n-1} - \sum_{k=1}^{n-1} 2000(1.03)^{k-1}$$

$$a_{20} = 98{,}000(1.03)^{19} - \left[\frac{2000}{1}\left(\frac{1-1.03^{19}}{1-1.03}\right)\right]$$

$\approx 121{,}609.85.$

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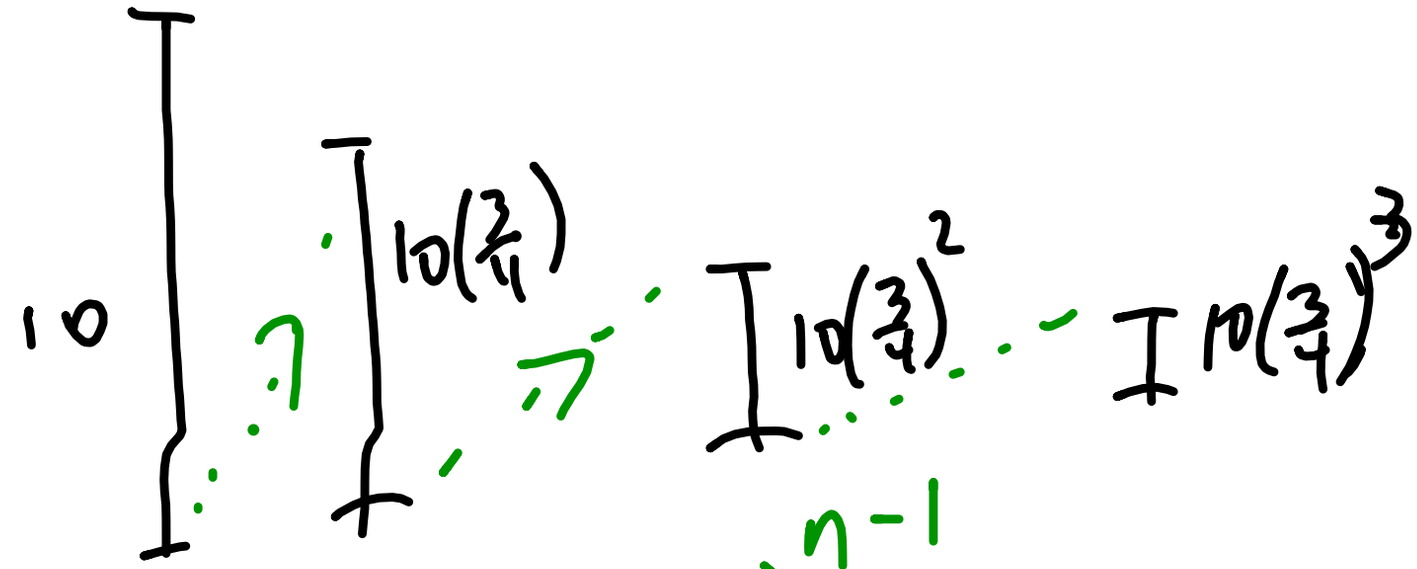
a_1 to a_2

$98{,}000(1.03) - W = 98{,}000$

$98{,}000(0.03) = W$

$\$2940 = W$

21



$$a_n = \frac{30}{4}\left(\frac{3}{4}\right)^{n-1}$$

$$\leq n^{th}\, 2\left(\sum_{k=1}^{n-1} a_n\right) + 10$$

Annuity → pay/receive constant cash flow over time.

Mortgages

maturity date: when you need to pay them back by

term: 30 years

interest rate:

you pay monthly.

! your interest and principal each month sums to a constant.