Exponential Growth and decay

Compounded interest:

If the initial value invested in a bank is given by "a", at a fixed interest rate of "i" compounded "n" times per year, then the accumulated capital "y" after x amount of years is given by the following formula

$$y = a\left(1 + \frac{i}{n}\right)^{nx}$$

Ex: If Mila invested 1000 dollars in Desjardin at an interest rate of 6%

compounded

1. annually
2. Every 6 months
3. Each month
4. Each day

How much money would she have as an old woman of 89? She is currently 16 years old.

$$y = a\left(1 + \frac{i}{n}\right)^{nx}$$

a = initial value = \$1000

i = 6% = 0.06

x = # years = 73 (89 − 16)

1. $n = 1$

$$y = 1000\left(1 + \frac{0.06}{1}\right)^{1 \times 73}$$

$$1000(1.06)^{73}$$

\$70,360.37

2. $n = 2$

$$y = 1000\left(1 + \frac{0.06}{2}\right)^{2 \times 73}$$

$$y = 1000(1.03)^{146}$$

\$74857.41

3. $n = 12$

$$y = 1000\left(1 + \frac{0.06}{12}\right)^{12 \times 73}$$

$$y = 1000(1.005)^{876}$$

\$ y = 78,971 44

4. $n = 365$

$$y = 1000\left(1 + \frac{0.06}{365}\right)^{365 \times 73}$$

$$1000(1.000164\,38)^{26645}$$

\$ y = 79809.3

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