Clue 4: 2yrs 4.35yrs /5 Total for clue 4: /10

Q1: Given: FV PV
16 18 ..... ?

$$FV = R\left(\frac{(1+i)^n - 1}{i}\right) = 50\left(\frac{(1+\frac{0.038}{12})^{12\cdot 2} - 1}{\frac{0.038}{12}}\right) = 1244.73$$ ✓

$$PV = R\left(\frac{1-(1+i)^{-n}}{i}\right) = 25\left(\frac{1-(1+\frac{0.022}{12})^{-12\cdot t}}{\frac{0.022}{12}}\right)$$ ✓ → years

$$1244.73 = 25\left(\frac{1-(1.00183\overline{3})^{-12t}}{183\overline{3}\times 10^{-3}}\right)$$

$$49.7892 = \frac{1-(1.00183\overline{3})^{-12t}}{1.83\overline{3}\times 10^{-3}}$$ ✓

$$+0.9087 = +(1.00183\overline{3})^{-12t}$$

$$\log 0.9087 = -12t \log 1.00183\overline{3}$$

$$t = 4.35 //$$ ✓

Age: 16 + 2 + 4.35 = 22.35 years old //

General Form:

$$t_n = -(-3)^n + 1$$

$$100{,}000 = -(-3)^n + 1$$

$$+100{,}001 = +3^n$$ ✓

$$\log 100{,}001 = \log 3^n$$

$$n = \frac{\log 100{,}001}{\log 3}$$

$$= 10.48$$

$$\approx 11 //$$ ✓

Q2: /5

7, -17, 55, -161, 487, -1457, 4375, -13121 ✓

×-2.428 ×2.9 -2.99 -2.99 ✓

-3.2 -3.02 -3.00

It seems like the ratio gets closer to −3 as the sequence goes on. This means this geometric sequence must have a base of $(-3)^n$.... Lets first try this base

-3, 9, -27, 81, -243, 729, -2187, 6561 ✓

↑ This seems very similar if you multiply each term by 2.

-6, 18, -54, 162, -486, 1458, -4374, 13122

Now if we multiply by -1 and add 1, we get the sequence.