Challenge # 9

At the end of college, Nikolai invests nothing for 8 years, then he puts $200 every month into an account earning 7.2% interest compounded monthly for 36 years.

At the end of college, Sophia invests $200 at the end of each month for 8 years in an account earning 7.2% interest, compounded monthly. After 8 years she contributes nothing, but continues to earn 7.2% interest compounded monthly for 36 more years.

Who has the most money at the end of the 44 years?

Challenge #9 Solution

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At the end of college, Sophia invests $200 at the end of each month for 8 years in an account earning 7.2% interest, compounded monthly. After 8 years she contributes nothing, but continues to earn 7.2% interest compounded monthly for 36 more years.

Who has the most money at the end of the 44 years?

Nikolai

$$A = PmT\left(\frac{\left(1+\frac{APR}{n}\right)^{ny}-1}{\frac{APR}{n}}\right)$$

$$=200\left(\frac{\left(1+\frac{0.072}{12}\right)^{36(12)}-1}{\frac{0.072}{12}}\right)$$

$$\approx \$408{,}447.04$$

Sophia

$$A = PmT\left(\frac{\left(1+\frac{APR}{n}\right)^{ny}-1}{\frac{APR}{n}}\right)$$

$$A_1 = 200\left(\frac{\left(1+\frac{0.072}{12}\right)^{12(8)}-1}{\frac{0.072}{12}}\right)$$

$$= \$25{,}861.65$$

$$A_2 = P\left(1+\frac{r}{n}\right)^{nt} \quad \left(\text{compound interest formula}\right)$$

$$= 25861.65\left(1+\frac{0.072}{12}\right)^{12(36)}$$

$$\approx \$342{,}755.08$$

Nikolai invested a total of
$200(12)(36) = \$86{,}400

Sophia invested a total of
200(12)(8) = \$19{,}200