

Sun Kang borrowed \$5200 from his friend Hop Fong Yee to pay for remodeling work on his house. He repaid the loan over 10 months later with simple interest at 7%. Yee then invested the proceeds in a 5 year certificate of deposit paying 6.3% compounded quarterly. How much will he have at the end of 5 years?

To solve this problem, we need to break it down into two parts.

Simple Interest Loan: We need to determine the proceeds or interest from the loan using $I = Prt$ where the principal P is 5200, the rate r is 7%, and the time t is 10/12 year. Putting these values in gives

$$I = (5200)(.07)\left(\frac{10}{12}\right) \\ \approx 303.33$$

Compound the Interest on the Proceeds: Now we'll utilize $A = P(1+i)^n$ to calculate the final amount with the principal P being 303.33, the interest rate per period $i = \frac{.063}{4}$ and the number of compounding periods $n = (4)(5)$. Putting this into the compound interest formula gives

$$A = 303.33\left(1 + \frac{.063}{4}\right)^{20} \\ \approx 414.62$$

The proceeds have grown to \$414.62 after 5 years.