

Answer on Question #69721 – Math – Algebra

Question

Amanda put \$1500 in a savings account. After 5 years, she had \$1833 in the account. What rate of interest did she earn? Use the formula $A = Pe^{rt}$, where A is the ending amount, P is the principal (initial amount), r is the interest rate, and t is time.

Solution

Given

$$\begin{aligned} A &= 1833 \\ P &= 1500 \\ t &= 5 \end{aligned} \quad (1)$$

$$r = ?$$

Using the formula $A = Pe^{rt}$:

$$\begin{aligned} A &= Pe^{rt} \\ e^{rt} &= A/P \\ \ln(e^{rt}) &= \ln(A/P) \\ rt &= \ln(A/P) \\ r &= (\ln(A) - \ln(P))/t \end{aligned} \quad (2)$$

Substituting the given values (1) into the previous formula (2) one gets

$$r = (\ln(1833) - \ln(1500))/5 = (7.51 - 7.31)/5 = 0.2/5 = 0.04 = 4\%.$$

Answer: $r = 4\%$.