

**Task.** Achieve \$225,500 at 8.45% compounded continuously for 8 years, 145 days.

**Solution.** Recall that amount  $A$  after time  $t$  compounded continuously with principal amount  $P$  and annual interest rate  $r$  is given by the following formula:

$$A = Pe^{rt}.$$

We have that the resulting amount  $A = \$225,500$  and the rate  $r = 0.0845$ . Moreover, assume that each year has 365 days. Then 8 years and 145 days is equal to

$$t = 8\frac{145}{365} \approx 8.39726 \text{ years.}$$

Our aim is to find the principal amount  $P$ . From the formula  $A = Pe^{rt}$  we obtain

$$\begin{aligned} P &= A/e^{rt} = Ae^{-rt} = 225500 * e^{-0.0845*8.39726} = 225500 * e^{-0.70957} = \\ &= 225500 * 0.491856 = 110913.528 \approx \$110,913.53 \end{aligned}$$

**Answer.** The principal amount should be \$110,913.53