

Solutions 18000 Version Daily Compounded

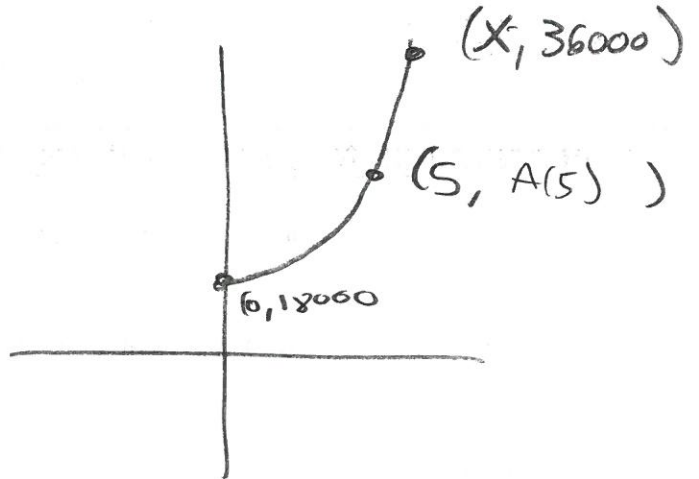
$$P = 18000$$

$$r\% = 3.24\%$$

$$r = 0.0324$$

$$n = \text{daily} = 365$$

$$A = P \left(1 + \frac{r}{n}\right)^{n \cdot x}$$



$$A(x) = 18000 \left(1 + \frac{0.0324}{365}\right)^{365x}$$

$$A(5) = 21165.33$$

Balance
after
5 years

$$36000 = 18000 \left(1 + \frac{0.0324}{365}\right)^{365(x)}$$

$$\frac{36000}{18000} = \frac{18000 \left(1 + \frac{0.0324}{365}\right)^{365x}}{18000}$$

$$2 = \left(1 + \frac{0.0324}{365}\right)^{365x}$$

By Defn

$$\log \left(1 + \frac{0.0324}{365}\right) (2) = 365x$$

$$x = \frac{\log \left(1 + \frac{0.0324}{365}\right) 2}{365}$$

$$x \approx 21.3944$$

time to Double

Earnings after 5 years

$$21165.33 - 18000$$

$$\$ 3165.33$$

Solutions 18000 weekly compounded

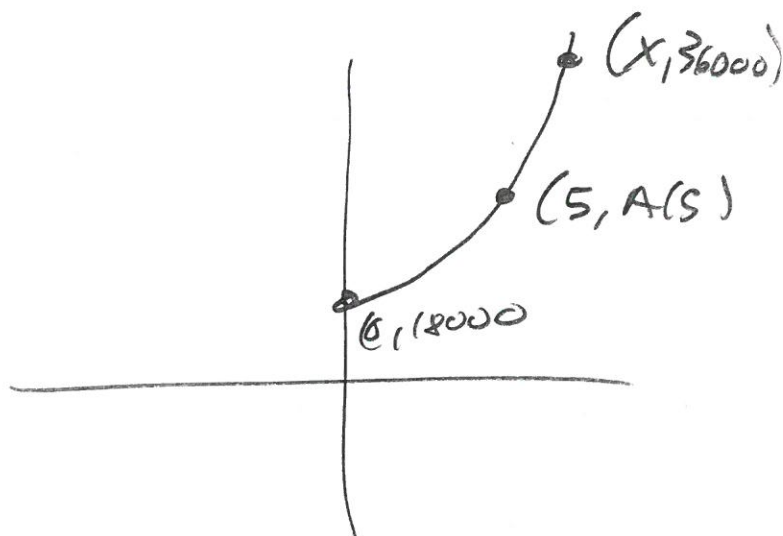
$$P = 18000$$

$$r\% = 3.24\%$$

$$r = 0.0324$$

$$n = \text{weekly}$$

$$= 52 \text{ weeks}$$



Model

$$A(x) = 18000 \left(1 + \frac{0.0324}{52}\right)^{52x}$$

$$A(5) = 21164.42$$

Balance After 5 years

Earnings after 5 years

$$21164.42 - 18000$$

$$\$3164.42$$

$$36000 = 18000 \left(1 + \frac{0.032}{52}\right)^{52x}$$

$$\frac{36000}{18000} = \frac{18000 \left(1 + \frac{0.032}{52}\right)^{52x}}{18000}$$

$$2 = \left(1 + \frac{0.032}{52}\right)^{52x}$$

By Defn

$$\log\left(1 + \frac{0.032}{52}\right)(2) = 52x$$

$$x = \frac{\log\left(1 + \frac{0.032}{52}\right)^2}{52}$$

$$x \approx 21.4010 \text{ years}$$

time to double

Solutions 18000 version cts compounding

$$P = 18000$$

$$r = 0.0324$$

$n =$ cts compounding

$$A(x) = 18000 e^{0.0324x}$$

model

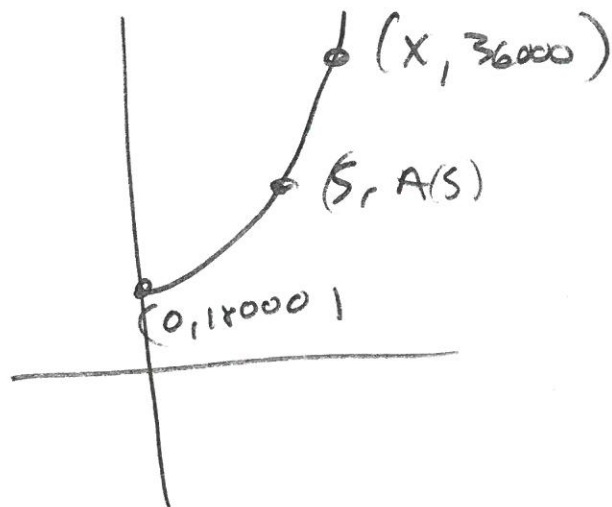
$$A(5) = 21165.48$$

Balance After 5 yrs

Earnings after 5 years

$$21165.48 - 18000$$

$$\$3165.48$$



$$36000 = 18000 e^{0.0324x}$$

$$\frac{36000}{18000} = \frac{18000 e^{0.0324x}}{18000}$$

$$2 = e^{0.0324x}$$

By Defn

$$\ln 2 = 0.0324x$$

$$x = \frac{\ln 2}{0.0324}$$

$$x \approx 21.3934$$

Time to Double

Given $A(x) = 25000 e^{0.042x}$

$P = 25000$	←	principal
$r = 0.042$	←	rate as decimal
$r\% = 0.042(100) = 4.2\%$	←	rate as %

Interest continually compounded

$A(10) = 25000 e^{0.042(10)}$	
$= 38049.04$	← Balance after 10 years

Balance when EARNING 5000

$$25000 + 5000 = 30000$$

$$A(x) = 30000$$

$$30000 = 25000 e^{0.042x}$$

$$\frac{30000}{25000} = \frac{25000 e^{0.042x}}{25000}$$

$$\frac{30000}{25000} = 1.2 = \frac{6}{5} = e^{0.042x}$$

By Defn $\ln\left(\frac{30000}{25000}\right) = 0.042x$

\checkmark
$A(4.3410)$
≈ 30000.13

$x = \frac{\ln\left(\frac{30000}{25000}\right)}{0.042}$
$x \approx 4.3410$

$P = 75000$ Investment

$A(x) = 500000$

cts compound's

$x = 18$

$$A(x) = Pe^{rx}$$

Find "r"

$$50000 = 75000 e^{18r}$$

$$\frac{50000}{75000} = \frac{75000 e^{18r}}{75000}$$

$$\frac{50000}{75000} = \frac{20}{3} = e^{18r}$$

By Defn

$$\ln\left(\frac{50000}{75000}\right) = 18r$$

exact
Rate

$$r = \frac{\ln\left(\frac{50000}{75000}\right)}{18}$$

approx rate

$$r \approx 0.1054$$

approx rate
as %

$$100r = 10.54\%$$

$$r\% = 10.54\%$$

$$\begin{aligned} \text{sv } A(18) &= 75000 (e^{0.1054(18)}) \\ &\approx 500040.01 \end{aligned}$$