October 23

EX5. If $600 is invested at 6% interest compounded continuously, how long will it take before the amount is $900?

$A = Pe^{rt}$

A: 900
P: 600
r: 6% ÷ 100 = .06
t: ?

$\frac{900}{600} = \frac{600 \cdot e^{.06t}}{600}$

$1.5 = e^{.06t}$

$\ln 1.5 = \ln e^{.06t}$

$\frac{\ln 1.5}{\ln e} = \frac{.06t \cdot \ln e}{\ln e}$

$\frac{.41}{.06} = \frac{.06t}{.06}$

6.76 years = t

EX6. How long does it take $1500 to double if it is invested at 6% interest compounded semiannually?

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

A: 1500 · 2 = 3000
P: 1500
r: 6% ÷ 100 = .06
n: 2
t: ?

$\frac{3000}{1500} = \frac{1500\left(1 + \frac{.06}{2}\right)^{2t}}{1500}$

$2 = \left(1 + \frac{.06}{2}\right)^{2t}$

$\ln 2 = \ln\left(1 + \frac{.06}{2}\right)^{2t}$

$\frac{\ln 2}{\ln\left(1 + \frac{.06}{2}\right)} = \frac{2t \cdot \ln\left(1 + \frac{.06}{2}\right)}{\ln\left(1 + \frac{.06}{2}\right)}$

$\frac{23.45}{2} = \frac{2t}{2}$

11.72 years = t