Evaluate the following **with** a calculator.

10. A car bought for $13,000 depreciates (the value decays) at 12% every year. What is the value of the car after 7 years?

$$P = A_0(1 \pm r)^t$$

$$P = 13{,}000(1-0.12)^7$$

$$= 13{,}000(.88)^7$$

$P = \$5{,}312.78$

11. If Johnny wants to invest $5,000 into an account at a 9.5% interest rate compounded quarterly (four times a year), how long will it take until the money in his account has grown to $10,000?

$$P = A_0\left(1 \pm \frac{r}{n}\right)^{nt}$$

$$10{,}000 = 5{,}000\left(1 + \frac{.095}{4}\right)^{4(t)}$$

$$2 = (1.02375)^{4t}$$

$$\ln 2 = 4t \ln(1.02375)$$

$$\frac{\ln 2}{\ln(1.02375)} = 4t$$

$$29.53 = 4t$$

$t = 7.38$ years

12. You have $1,000 to invest. Your bank offers a fixed annual interest rate of 1.8%, compounded continuously. What is the balance of your bank account after five years?

$$A = Pe^{rt}$$

$$A = 1{,}000\, e^{.018(5)}$$

$A = \$1{,}094.17$

13. An investment account has $3000 currently. The principal amount was $2000 with a Fixed Annual Interest Rate of 4.2%. How long ago did the investment account begin?

$$A = Pe^{rt}$$

$$3000 = 2000\, e^{.042(t)}$$

$$\frac{3}{2} = e^{.042t}$$

$$\ln\left(\frac{3}{2}\right) = 0.042t$$

$t = 9.6539$ years ago