

## Worksheet 9/29/2023

- *Continuous compounding:*

$$A = Pe^{APR \cdot n}$$

where  $P$  = original principal and  $A$  = accumulated balance in  $n$  years.

- *Annuity:*

$$A = p \frac{(1+i)^n - 1}{i}$$

where  $p$  = payment per period,  $i$  = interest rate per period,  $A$  = accumulated balance in  $n$  periods.

1. You deposit \$500 in an account with an APR of 12%. With continuous compounding, how much money will you have at the end of 6 months? At the end of 1 year? At the end of 5 years?

2. You put \$300 per month in an investment plan that pays an APR of 3.5%. How much money will you have paid in 18 years? How much money will you have after 18 years?

3. At age 35, you start saving for retirement. If your investment plan pays an APR of 6% and you want to have \$1 million when you retire in 30 years, how much should you deposit monthly?

4. Which of the following investment methods will give more money at the end of 5 years?

Method 1: monthly deposit of \$100 and APR = 7.2%

Method 2: one-time deposit of \$20,000 and APR = 6%