

5.6 Classwork: Compound Interest

I can calculate compound interest

CCSS.HSF.LE.A.2

$$FV = PV \times \left(1 + \frac{r}{100k}\right)^{kn} \text{ where FV is the future value,}$$

PV is the present value, n is the number of years,
k is the number of compounding periods per year,
r% is the nominal annual rate of interest

1. Do Now: Louis invests \$8,500 in an account with an annual interest rate of 4.15%. What is the balance after 4 years?

2. A three year loan for \$17,500 compounds monthly with an annual interest rate of 7.25%.

- (a) How many compounding periods are there per year?

$$k =$$

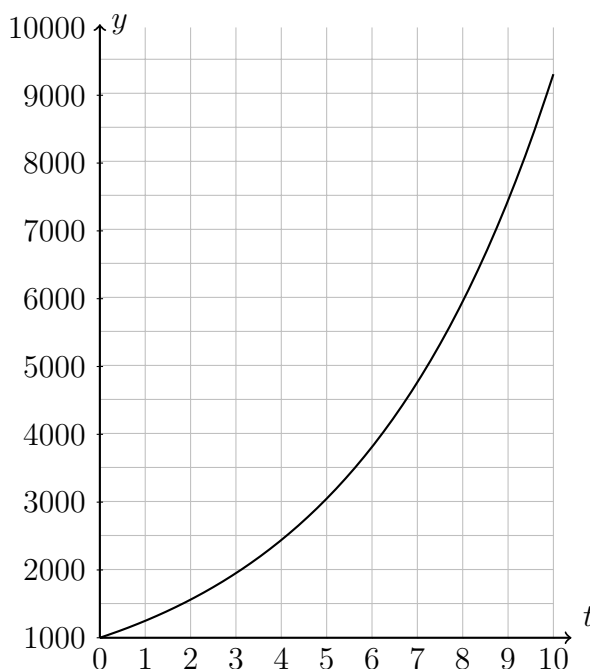
- (b) Find the final balance of principal and interest after three years.

3. The graph shows the exponential function $f(x) = 1000 \times (1.25)^t$ representing growth with a base of 1.25 over t periods.

- (a) Write down the initial value of the function.

- (b) Find $f(10)$

- (c) Find x such that $y = 6000$



4. Radioactive elements decay over time, with one half of the atoms decaying over a fixed period of time, the “half life.” The half life of plutonium-238 is about 90 years. Use the formula $y = A \times \left(\frac{1}{2}\right)^{t/90}$.
- (a) Find the percentage of plutonium that would remain after 1000 years.
- (b) Find the number of years required for 99 percent of the plutonium to decay.

5.6 Exit Note: Simple interest rates

5. Carlos puts \$9,800 into an investment account with an annual interest rate of 2.75%. What is the balance after 3 years, rounded to the nearest cent?

6. The graph shows the exponential function $FV = 1,100 \times \left(1 + \frac{6.125}{100}\right)^t$ representing the balance of an investment account earning a fixed rate of interest over t in years.

- (a) Write down the initial deposit in the account.
- (b) What is the annual interest rate?
- (c) Approximately how much will the account hold at the end of ten years?
- (d) When will the balance be \$1,400?

