BECA / IB Math 5 Exponential functions 2 March 2022

Name:

5.6 Exit Note: Compound Interest

I can calculate compound interest

CCSS.HSF.LE.A.2

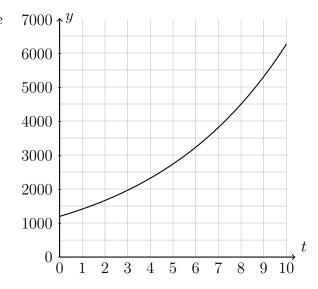
$$FV = PV \times \left(1 + \frac{r}{100k}\right)^{kn}$$
 where FV is the future value,

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 $f(t) = 1200 \times (1 + 0.18)^t$ representing 18% annual growth rate over t years.
 - (a) Write down the initial value of the function.



(c) Find t such that y = 2000



5.6 Exit Note: Simple interest rates

- 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. 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?

