BECA / IB Math 5 Exponential functions
2 March 2022

Name: SOLUTIONS

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?

$FV = 8,500\left(1 + \frac{4.15}{100}\right)^{4}$

$= 10,001.290057\ldots \approx 10,001.29$

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?

   $k = 12$

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

$FV = 17,500\left(1 + \frac{7.25}{100(12)}\right)^{(12\times 3)}$

$= 21,737.665302\ldots \approx 21,737.67$

3. The graph shows the exponential function $f(x) = 1200 \times (1 + 0.18)^t$ representing 18% annual growth rate over t years.

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

   1200

   (b) Find $f(8)$ = 4,500

   exact $(4510.6310\ldots)$

   (c) Find t such that $y = 2000$

   $t = 3$