BECA/Huson/Algebra II 4: Exponential functions & Rational Exponents Name:
3 April 2024

4.7 PreExam: Exponential Functions and 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. Write down the formula for a function $f(x)$ that increases 15% for each increase of 1 in input value x.

2. The price of a share of stock in a particular company is \$2.25 per share in 2010. Assume that it increases in value by 6% annually thereafter.

   (a) Write an equation representing the value of the stock $P(t)$, in dollars, t years after 2010.

   (b) What does $P(30)$ represent in this context?

3. An investment of \$5,000 compounds monthly with an annual interest rate of 4%.

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

   $k =$

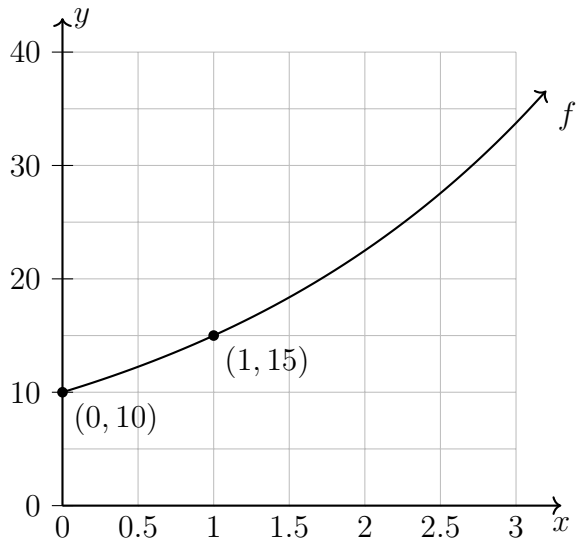
   (b) First write the formula for, and then calculate, the account balance of principal and interest after three years.

4. The graph shows the exponential function $f(x)$.

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

   (b) By what factor do the values of f increase each time x increases by 1?

   (c) By what factor would f increase when the input increases by 10?



5. A company depreciates a piece of equipment which was purchased in 2022 at a constant annual rate. The equation representing the value of the equipment $V(t)$, in dollars, t years after 2022 is $V(t) = 12,000 \times (0.85)^t$.

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

   (b) What does the value 0.85 tell us about the situation?

   (c) By what percent does the equipments value decrease each year?

   (d) Sketch the graph of the function.