BECA / IB Math 5 Exponential functions Name:
16 February 2022

5.3 Classwork: Exponential function bases

I can calculate simple interest CCSS.HSF.IF.C.7

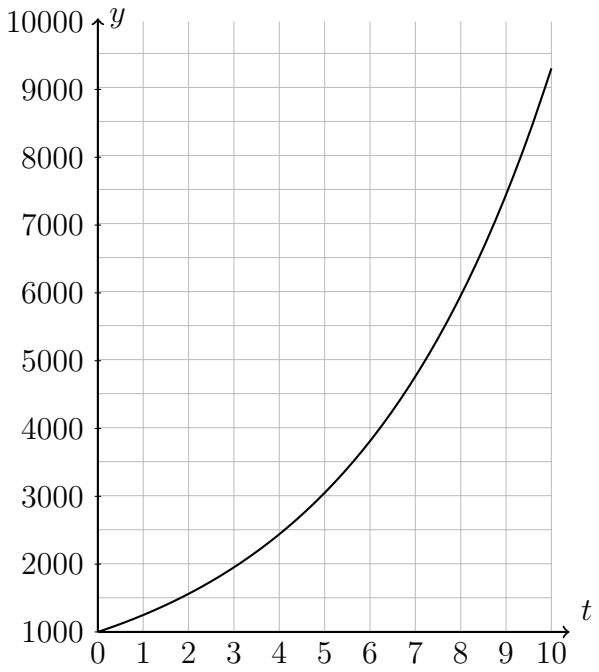
1. Do Now: Carlos puts $12,500 into an investment account with an annual interest rate of 3.15%. What is the balance after 5 years?

2. 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 $y = 6000$



3. 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.

5.3 Exit Note: Simple interest rates

4. Simplify each expression to the base raised to a power.

   (a) $7^3 \times 7^6$

   (b) $\dfrac{5^8}{5^4}$

   (c) $x^2 \times x^9$

   (d) $\left(\dfrac{z^7}{z^2}\right)^2$

5. A bank account earns interest at an annual interest rate of 5.125%. The initial deposit is \$225. Which equation models the value of the balance?

   (a) $FV = 225 \cdot \left(\dfrac{5.125}{100}\right)^t$

   (b) $FV = 225(1 + 5.125)^t$

   (c) $FV = 225 \cdot 5.125^t$

   (d) $FV = 225 \cdot \left(1 + \dfrac{5.125}{100}\right)^t$

6. 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?

7. The graph shows the exponential function $FV = 1,100 \times \left(1 + \dfrac{6.125}{100}\right)^t$ 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?