


For each of the following functions, identify first whether it represents a type of "exponential growth" or "exponential decay". Then identify the **y-intercept** and the **equation** of the **asymptote** of the graph of the function. Also state the **domain** and **range** of the function, and sketch a **graph**.

Example: $y = \frac{1}{4} \cdot 6^x$



"Growth" or "Decay"? Exponential growth

y-intercept: $(0, \frac{1}{4})$

Equation of Asymptote: $y = 0$

Domain: all Real numbers

Range: $y > 0$

1.) $y = 11 \cdot 3^x$

"Growth" or "Decay"? _____

y-intercept: _____

Equation of Asymptote: _____

Domain: _____

Range: _____

2.) $y = \left(\frac{1}{5}\right)^{-x} + 4$

"Growth" or "Decay"? _____

y-intercept: _____

Equation of Asymptote: _____

Domain: _____

Range: _____

3.) $y = 7 \cdot \left(\frac{3}{8}\right)^x - 1$

"Growth" or "Decay"? _____

y-intercept: _____

Equation of Asymptote: _____

Domain: _____

Range: _____

4.) $y = 2 \cdot e^x$

"Growth" or "Decay"? _____

y-intercept: _____

Equation of Asymptote: _____

Domain: _____

Range: _____

5.) $y = \frac{5}{6} \cdot (0.9)^x$

"Growth" or "Decay"? _____

y-intercept: _____

Equation of Asymptote: _____

Domain: _____

Range: _____



Warren Buffett, smart investor that he is, invests \$100 in an account that pays 100 % annual interest. How much money will he have in this account at the end of one year if:

- a) the money is compounded annually. _____
- b) the money is compounded quarterly. _____
- c) the money is compounded monthly. _____
- d) the money is compounded weekly. _____
- e) the money is compounded daily. _____
- f) the money is compounded hourly. _____
- g) the money is compounded each minute. _____
- h) What do these calculations have to do with the number "e"?

Simplify each of the following expressions **completely**. Leave answers in exact form – **do not give decimal approximations** for answers!

6.) $e^3 \cdot e^6$

7.) $\frac{e^{-7x}}{e^{2x}}$

8.) $(4e^{-5})^{-1}$

9.) $\sqrt{16e^{2x}}$

10.) $\frac{-3e^4}{e}$

11.) $\left(\frac{2e^{-1}}{8e^{-9}}\right)^{\frac{1}{2}}$

12.) $\frac{7e^x}{e^{7x}}$

13.) $(5e^{-2})^3$

14.) $\sqrt[3]{64e^{6x}}$

15.) $e^{3x} \cdot e^{2-3x}$

16.) Write an exponential function in the form $y = a \cdot b^x$ that goes through the points (0,4) and (5,128).

17.) Write an exponential function in the form $y = a \cdot b^x$ that goes through the points (1,81) and (4,3).