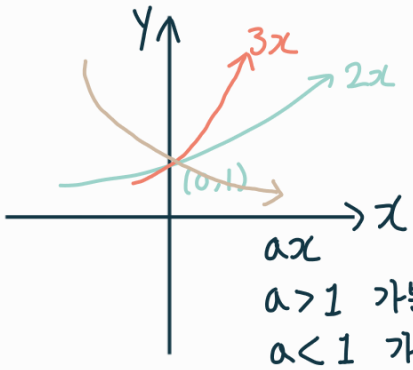
지수

$y = f(x)$ (function)

$y = 2^x$
$y = 3^x$



$a > 1$ 가분수 증가
$a < 1$ 가분수 감소
$a = 1$ 직선 (항상 1)

$2^0 = 1$, $3^0 = 1$을 생각하면 무조건 y의 1지점을 지남

$2^2 < 2^3$ 이니까 $y = (\frac{1}{2})^x$은 x가 커질수록 y가 작아짐. 기울기도 감소.

$\frac{9}{10}$ → 진분수 → 크면 감소 (어떤 1보다 작으면 감소)

루트

$(1^{\frac{1}{7}})^7 = 1 = \sqrt[7]{1}$

$\sqrt[5]{3^5} = (3^{\frac{1}{5}})^5 = 3$

생략 $\sqrt[2]{2} = \sqrt{2} \Rightarrow (\sqrt[2]{2})^2 = 2$

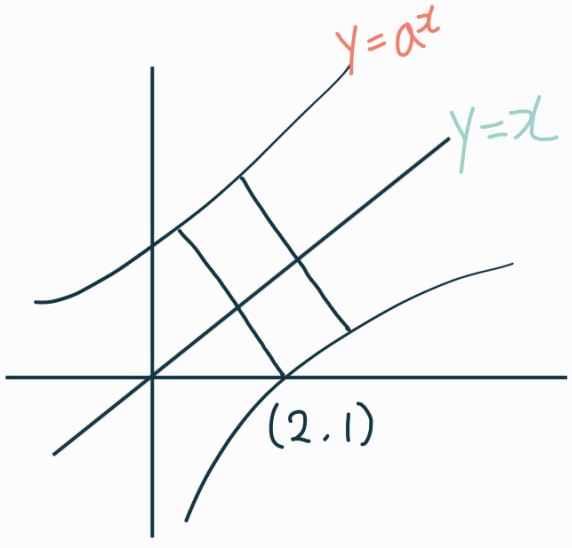
$\sqrt[7]{1} = 1^{\frac{1}{7}}$

$\frac{(1^{\frac{1}{7}})^7}{\sqrt[7]{1}} = 1$

로그

$\log_a b = x$

$\Leftrightarrow a^x = b$



log 쓰는 이유: x가 커질수록 기하학적으로 커짐.

메모리 용량을 줄일 수 있음.

※ 밑 안 쓰면 10.

$\log x + \log y = \log xy$

$\log 10 = 1 = \log_{10} 10 = 1x$

$\log_a b = 0, \quad b = a^0 = 1$

$\log_a b^{-1} = 0$

$\log_a a^{-1} = 0$

$\log_e e^1 = 1$

$\log_{10} 1000 = \log 10^3 = \frac{3\log 10}{1}$

$\log 2^{q-1} = \log 2^{\frac{1}{q}}$

$(2^{-2} = \frac{1}{4})$

$\log \frac{b}{a} = ? = \log(b \times \frac{1}{a}) = \log b + \log \frac{1}{a}$??

$= \log b + \log a^{-1}$

$= \log b - \log a$

$\log_a b = \frac{\log_c b}{\log_c a}$

$\log_8 16 = \frac{\log_2 16}{\log_2 8} = \frac{\log 2^4}{\log 2^3} = \frac{4}{3}$

문제) $\log 2 = 0.3$

$\log 3 = 0.4$

① $\log_2 9 = \frac{\log 9}{\log 2} = \frac{0.4 \times 2}{0.3}$

② $\log_8 4 = \frac{\log_2 4}{\log_2 8} = \frac{\log 2^2}{\log 2^3} = \frac{2}{3}$

③ $\log_{16} 4 = \frac{2}{4} = \frac{1}{2}$

④ $\log_9 8 = \frac{\log 2^3}{\log 3^2} = \frac{0.3 \times 3}{0.4 \times 2}$

$\log_2 9 = \frac{\log 9}{\log 2} = \frac{0.4 \times 2}{0.3}$

$\log \frac{1}{a} = \log a^{-1}$

$\log \frac{1}{a} \rightarrow \log a$

$a^{-n} = \frac{1}{a}$

$a^2 = 2$

2^{-2}

$\frac{1}{a} = a^{-1}$

$2^{-4} = \frac{1}{16}$

$2^4 = 16$

$2^{-2} = \frac{1}{4}$

$3^{-3} = \frac{1}{27}$

$5!$

$2!$

$2! \quad 2$

$1 \quad 2 \quad 2$

$\frac{1 \times 2 \times 3 \times 4 \times 5}{5 \times 4 \times 3 \times 2 \times 1}$

$\frac{1 \times 2 \times 3 \cdot 6}{3 \times 2 \times 1 \cdot 6}$