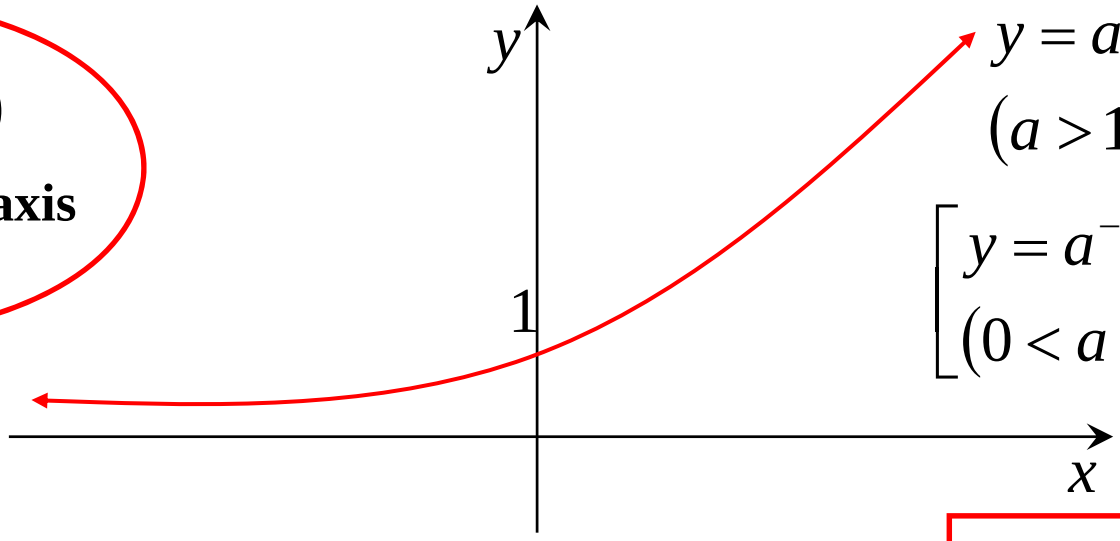
Exponential Function

$y = f(-x)$

reflects in the *y*-axis



$y = a^x$

$(a > 1)$

$\left[y = a^{-x} \right.$

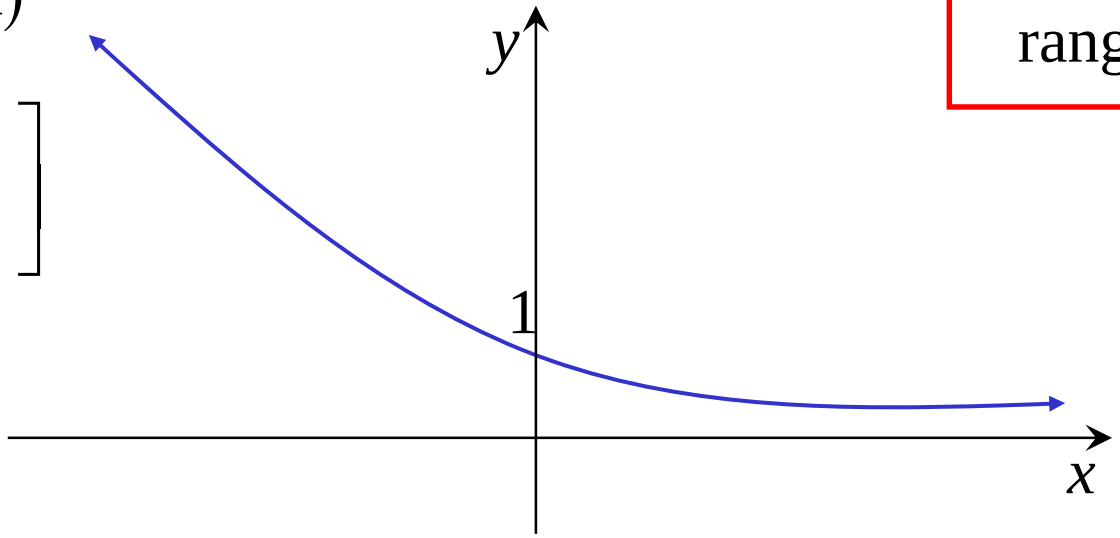
$\left. (0 < a < 1) \right]$

$y = a^x$

$(0 < a < 1)$

$\left[y = a^{-x} \right.$

$\left. (a > 1) \right]$

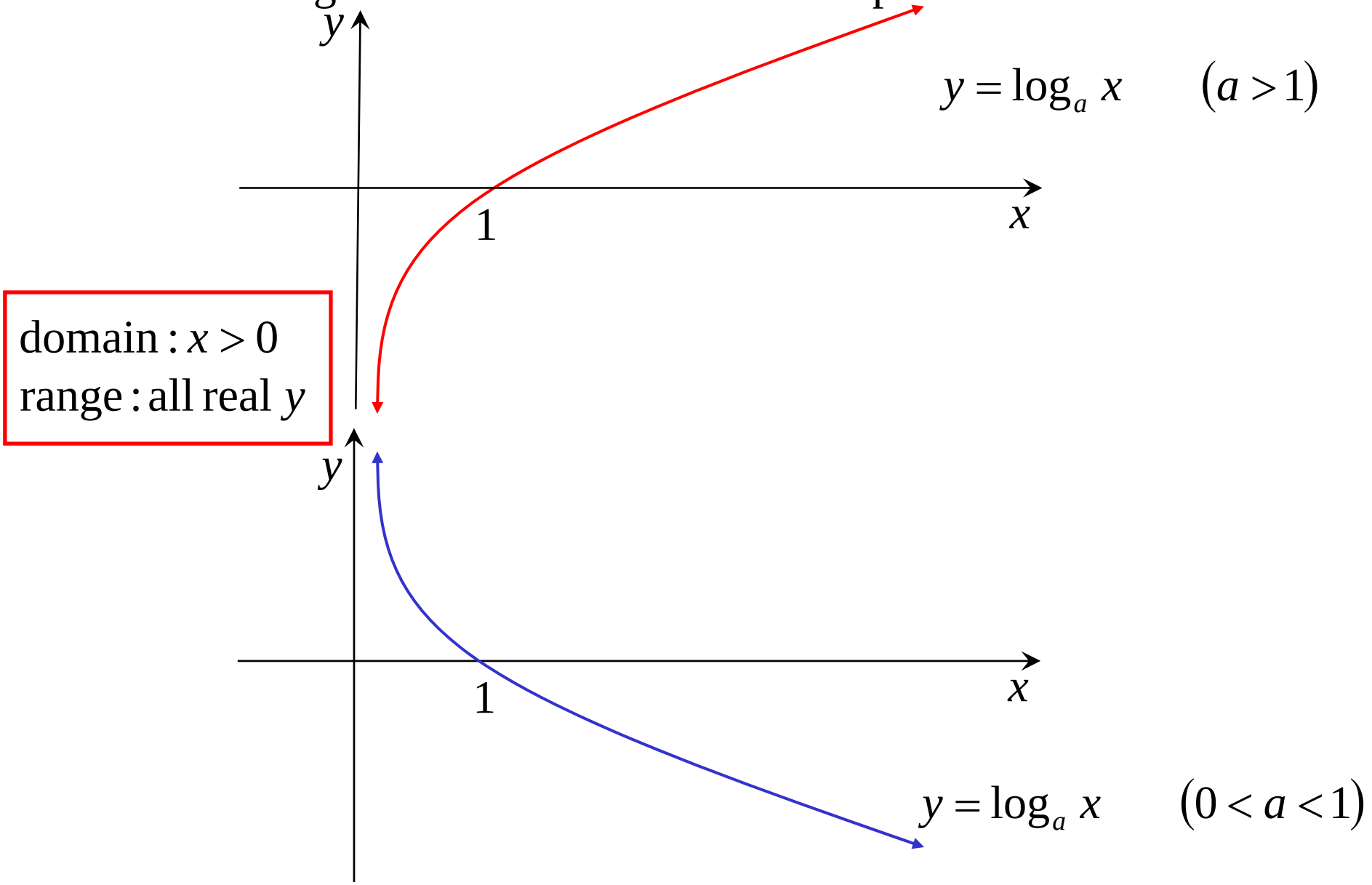


domain : all real x

range : $y > 0$

Logarithmic Function

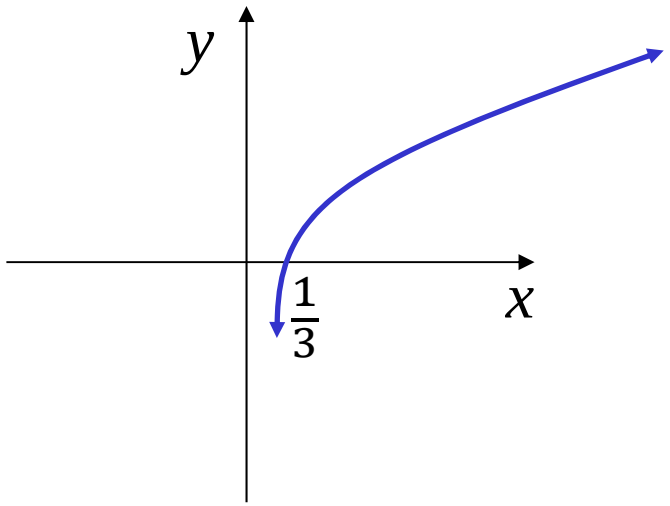
Logarithms are the **inverse** of exponentials.



e.g. $(i)\ y = \log(3x)$

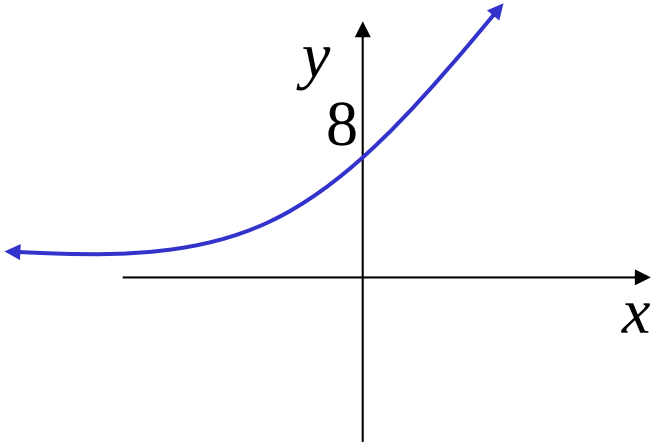
$$y = \log 3 + \log x$$

1. *basic curve*: $y = \log x$
2. *shift up log 3 units*



$(ii)\ y = 2^{x+3}$

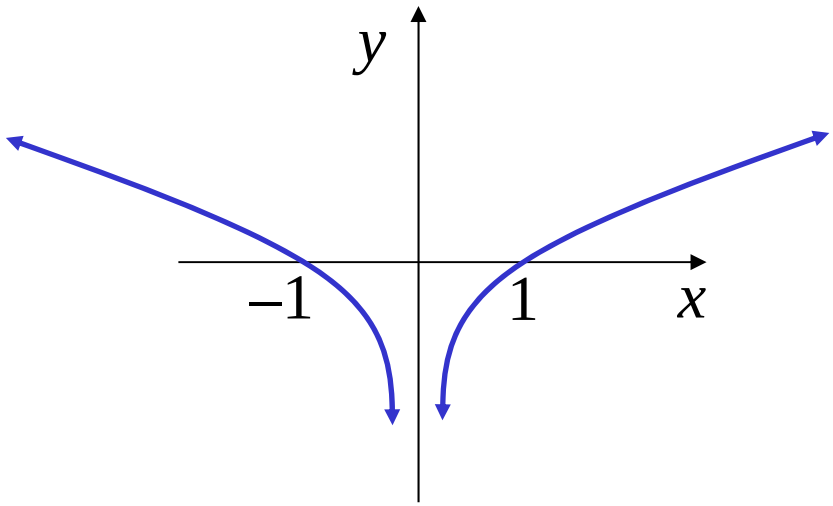
1. *basic curve*: $y = 2^x$
2. *shift left 3 units*



e.g. $(i)\ y = \log|x|$

1. *basic curve*: $y = \log x$

2. *reflect in y axis*



Exercise 8F; 10acef, 11adef, 12

Exercise 8G; 1, 2, 4, 6, 8, 10