

8.2 Transformations of Logarithmic Functions

A Transformations of Logarithmic Functions

The function:

$$g(x) = A \log_b B(x-C) + D$$

is a transformation of the parent function $f(x) = \log_b x$.

Here are some features of the function $g(x)$:

Domain:

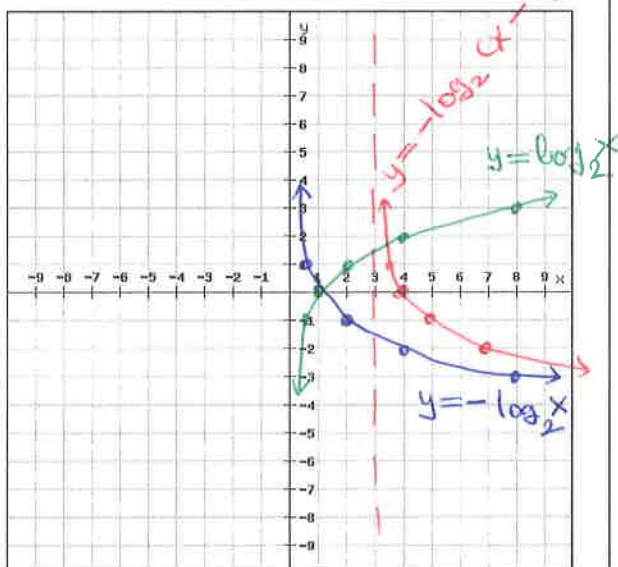
- If $B > 0$ then $D = (C, \infty)$
- If $B < 0$ then $D = (-\infty, C)$

Range: R

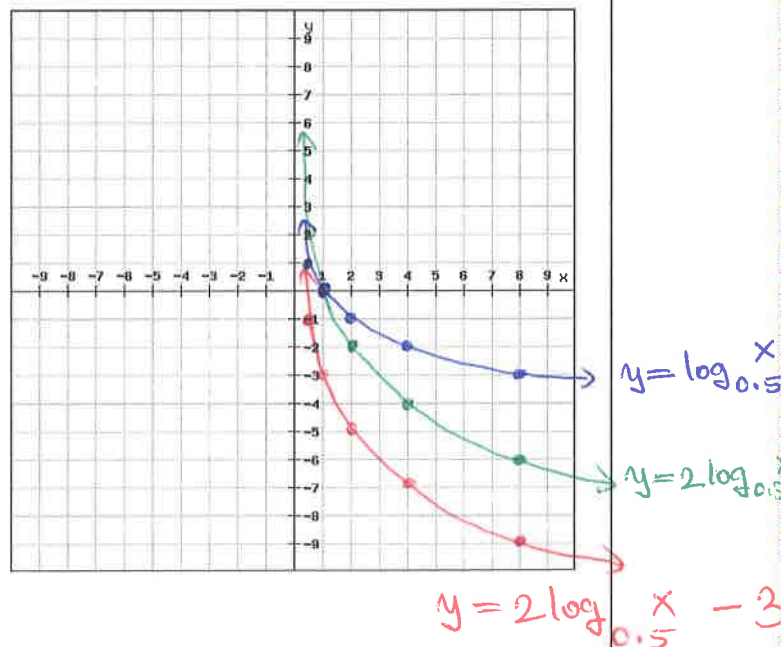
Vertical Asymptote: $x = C$

Ex 1. For each case, use three key points to graph the logarithmic function. Specify the domain, range, and the equation of the vertical asymptote.

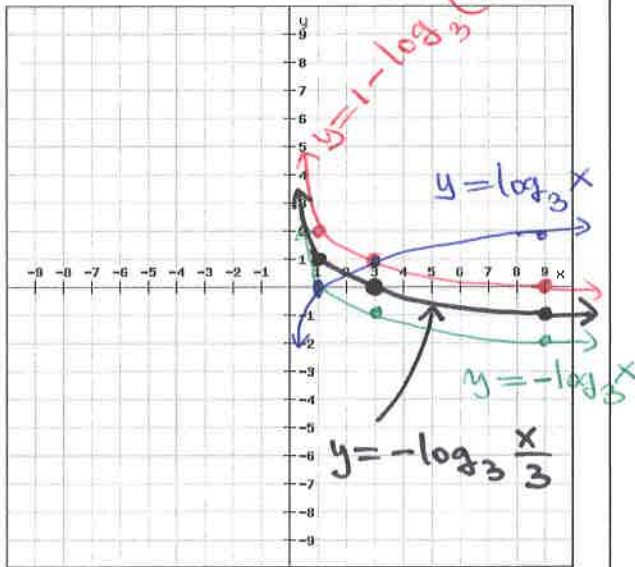
a) $y = -\log_2(x-3)$



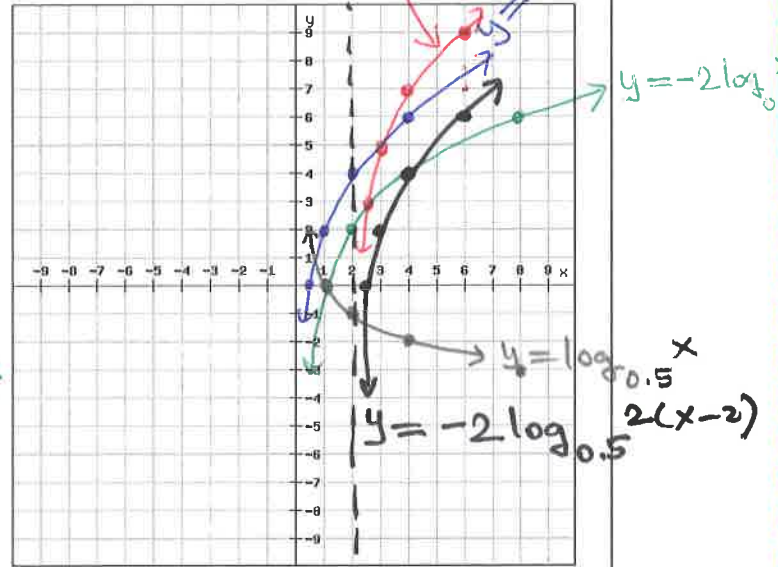
b) $y = 2 \log_{0.5} x - 3$



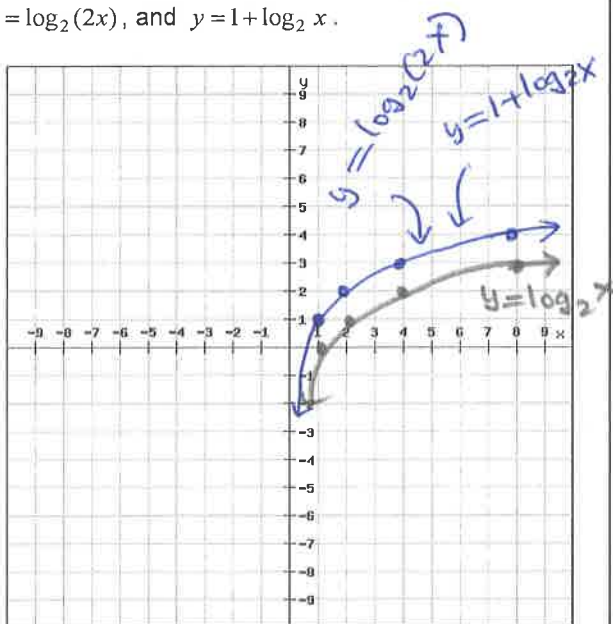
c) $y = 1 - \log_3(x/3)$



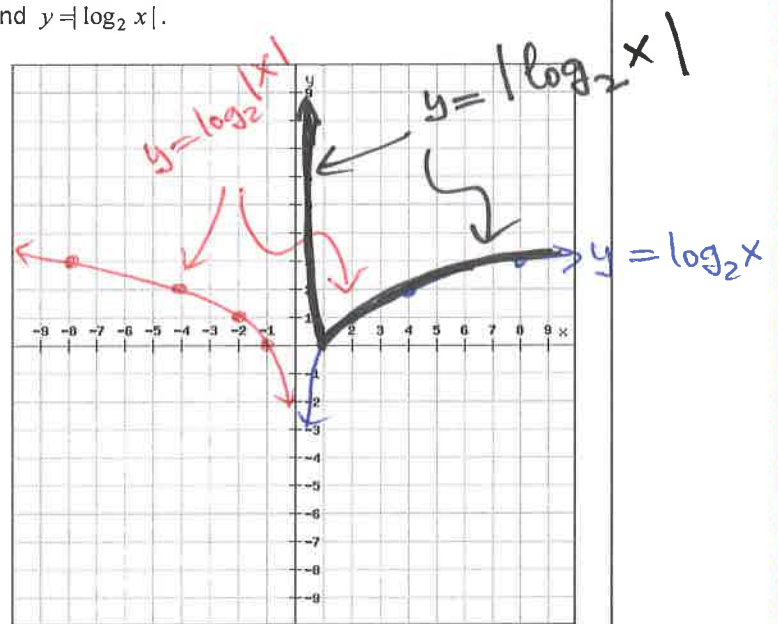
d) $y = -2 \log_{0.5}(2x-4) + 3$



Ex 2. Graph on the same grid $y = \log_2 x$, $y = \log_2(2x)$, and $y = 1 + \log_2 x$.



Ex 3. Graph on the same grid $y = \log_2 x$, $y = \log_2 |x|$, and $y = |\log_2 x|$.



Reading: Nelson Textbook, Pages 452-457

Homework: Nelson Textbook, Page 457: #4, 5, 6, 7, 8, 9, 11