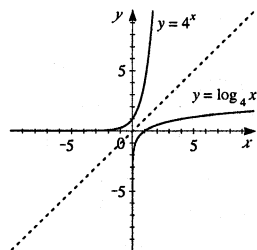


43. The graph of $y = \log_4 x$ is obtained from the graph of $y = 4^x$ by reflecting it about the line $y = x$.



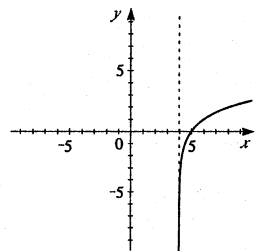
45. $f(x) = \log_2(x - 4)$

The graph of f is obtained from the graph of $y = \log_2 x$ by shifting it to the right 4 units.

Domain: $(4, \infty)$

Range: $(-\infty, \infty)$

Vertical asymptote: $x = 4$



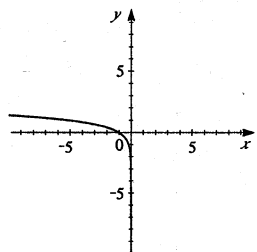
47. $g(x) = \log_5(-x)$

The graph of g is obtained from the graph of $y = \log_5 x$ by reflecting it about the y -axis.

Domain: $(-\infty, 0)$

Range: $(-\infty, \infty)$

Vertical asymptote: $x = 0$



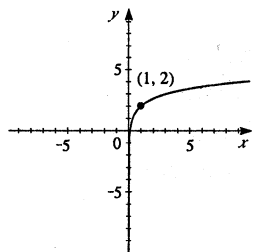
49. $y = 2 + \log_3 x$

The graph of $y = 2 + \log_3 x$ is obtained from the graph of $y = \log_3 x$ by shifting it upward 2 units.

Domain: $(0, \infty)$

Range: $(-\infty, \infty)$

Vertical asymptote: $x = 0$



51. $y = 1 - \log_{10} x$

The graph of $y = 1 - \log_{10} x$ is obtained from the graph of $y = \log_{10} x$ by reflecting it about the x -axis, and then shifting it upward 1 unit.

Domain: $(0, \infty)$

Range: $(-\infty, \infty)$

Vertical asymptote: $x = 0$

