

10.  $(-3)^2 = 9$

11.  $(-3)^3 = -27$

12.  $(-3)^{-1} = \frac{1}{-3}$

13.  $(-3)^{-2} = \frac{1}{(-3)^2} = \frac{1}{9}$

14.  $(-3)^{-3} = \frac{1}{(-3)^3} = \frac{1}{-27}$

15.  $(-3)^{-4} = \frac{1}{(-3)^4} = \frac{1}{81}$

16.  $3^{\frac{1}{2}} = \sqrt{3}$

17.  $3^{\frac{1}{3}} = \sqrt[3]{3}$

18.  $3^{\frac{1}{4}} = \sqrt[4]{3}$

19.  $3^{\frac{1}{5}} = \sqrt[5]{3}$

20.  $\log_3 27 =$

30.  $\log_{-\frac{1}{3}}(-27) = \log_{(-3)^{-1}}(-3)^3 = -3$

31.  $\log_3 \sqrt[3]{3} = \frac{1}{3}$

32.  $\log_3 \frac{1}{\sqrt{3}} = \log_3 \frac{1}{3^{\frac{1}{2}}} = \log_3 3^{-\frac{1}{2}} = -\frac{1}{2}$

33.  $\log_{\frac{1}{10}} \sqrt{10} = \log_{10^{-1}} 10^{\frac{1}{2}} = \log_{10^{-1}} (10^{-1})^{-\frac{1}{2}} = \frac{1}{2}$

34.  $5^0 = 1$

35.  $5^1 = 5$

36.  $5^2 = 25$

37.  $5^3 = 125$

38.  $5^{-1} = \frac{1}{5}$

39.  $5^{-2} = \frac{1}{5^2}$

40.  $5^{-3} = \frac{1}{5^3} = \frac{1}{125}$

51.  $\log_5 25 = 2$

52.  $\log_5 125 = 3$

53.  $\log_5 \frac{1}{25} = -2$

54.  $\log_5 \frac{1}{125} = -3$

55.  $\log_{(-5)} 25 = 2$

56.  $\log_{(-5)}(-125) = 3$

57.  $\log_{-5} \frac{1}{-5} = -1$

58.  $\log_{\frac{1}{5}} 25 = -2$

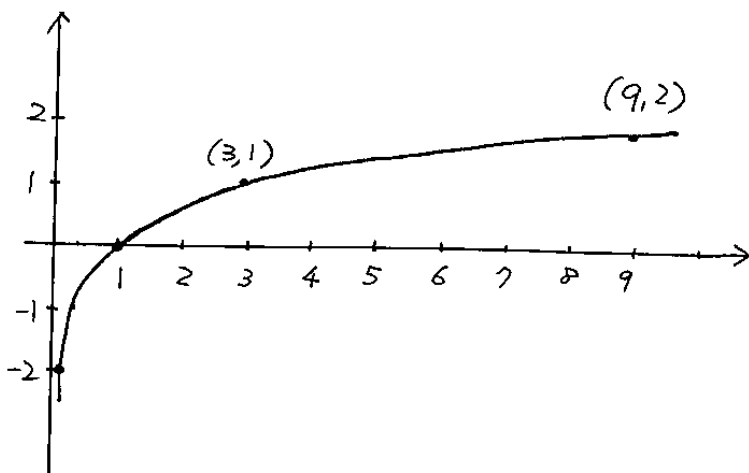
59.  $\log_{\frac{1}{5}} \sqrt{5} = \log_{5^{-1}} 5^{\frac{1}{2}} = \log_{5^{-1}} (5^{-1})^{-\frac{1}{2}} = -\frac{1}{2}$

60.  $\log_{\frac{1}{5}} \frac{1}{\sqrt{5}} = \frac{\log_5 \frac{1}{\sqrt{5}}}{\log_5 \frac{1}{5}} = \frac{-\frac{1}{2}}{-1} = \frac{1}{2}$

## 2.4 對數函數的圖形

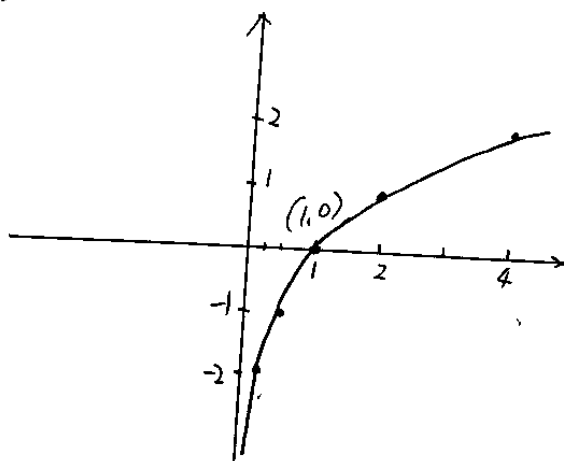
討論： $f(x) = \log_3 x$

x	$y = \log_3 x$
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
3	1
9	2



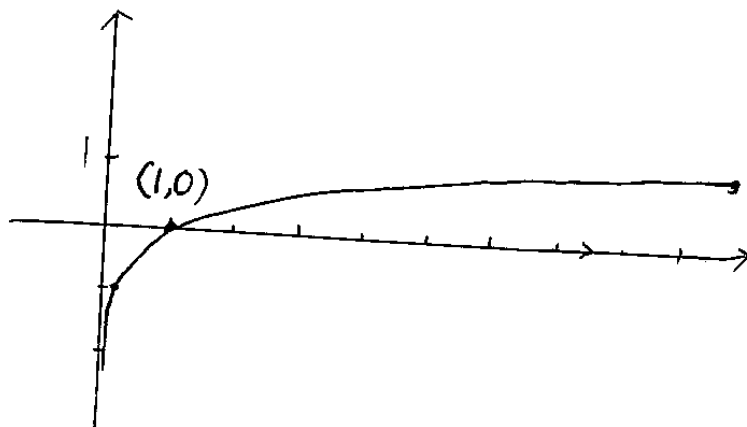
練習：作  $y = \log_2 x$  圖形

$x$	$y = \log_2 x$
$\frac{1}{4}$	$\log_2 \frac{1}{4} = -2$
$\frac{1}{2}$	$\log_2 \frac{1}{2} = -1$
1	$\log_2 1 = 0$
2	$\log_2 2 = 1$
4	$\log_2 4 = 2$



練習：作  $y = \log_{10} x$  圖形

$x$	$y = \log_{10} x$
0.1	$\log_{10} 0.1 = -1$
1	$\log_{10} 1 = 0$
10	$\log_{10} 10 = 1$



結論

$f(x) = \log_a x$  一定通過  $(1, 0)$