

數學 2 期末考練習

一、計算下列指數與對數

$7^0 = 1$ $7^1 = 7$ $7^2 = 49$ $(-7)^1 = -7$ $(-7)^2 = 49$

$5^{-3} = \frac{1}{5^3} = \frac{1}{125}$ $10^{-1} = \frac{1}{10}$ $10^{-2} = \frac{1}{100}$ $10^{-3} = \frac{1}{1000}$ $7^{-1} = \frac{1}{7}$

$(\frac{1}{7})^0 = 1$ $(\frac{1}{7})^2 = \frac{1}{49}$ $(\frac{1}{10})^0 = 1$ $(\frac{1}{10})^1 = \frac{1}{10}$ $(\frac{1}{10})^{-2} = \frac{1}{(\frac{1}{10})^2} = 100$

$10^5 = 100000$ $10^{-4} = 0.0001$ $16^{\frac{1}{2}} = 4$ $16^{\frac{3}{2}} = (4^2)^{\frac{3}{2}} = 4^3$ $16^{-\frac{3}{2}} = (4^2)^{-\frac{3}{2}} = 4^{-3} = \frac{1}{64}$

$(5^{13})^2 = 5^{26}$

$(6^3)^4 = 6^{12}$

$(10^4)^{-3} = 10^{-12}$

$(6^{-3})^4 = 6^{-12}$

$\log_5 25 = 2$

$\log_5 125 = \log_5 5^3 = 3$

$\log_5 \frac{1}{5} = \log_5 5^{-1} = -1$

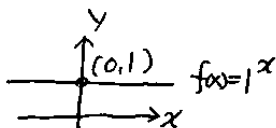
$\log_5 \sqrt{5} = \log_5 5^{\frac{1}{2}} = \frac{1}{2}$

$\log_{10} 10000 = \log_{10} 10^4 = 4$

$\log_{10} 0.00001 = \log_{10} 10^{-5} = -5$

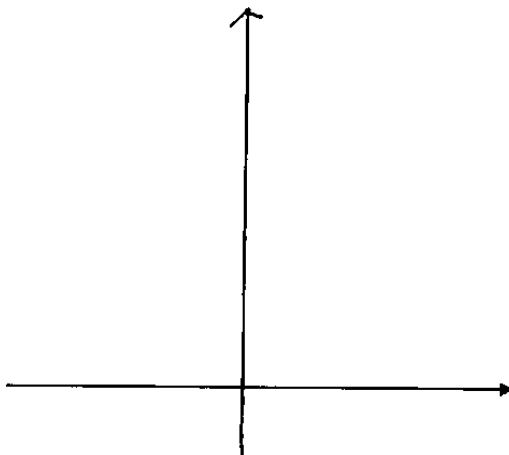
二、作下列各函數圖形

1. 作 $f(x) = 1^x$ 的圖形



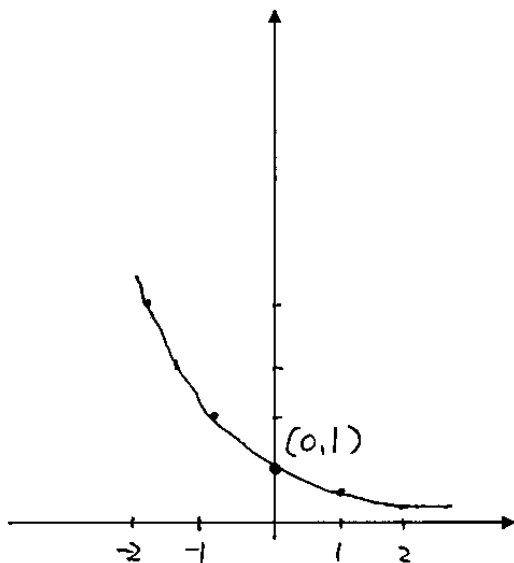
2. 作 $f(x) = 2^x$ 之圖

x	Y=2 ^x
-2	2 ⁻² = $\frac{1}{4}$
-1	2 ⁻¹ = $\frac{1}{2}$
0	2 ⁰ = 1
1	2 ¹ = 2
2	2 ² = 4



3. 練習：作 $f(x) = (\frac{1}{2})^x$ 之圖

x	$Y = (\frac{1}{2})^x$
-2	$(\frac{1}{2})^{-2} = \frac{1}{(\frac{1}{2})^2} = 4$
-1	$(\frac{1}{2})^{-1} = \frac{1}{(\frac{1}{2})} = 2$
0	$(\frac{1}{2})^0 = 1$
1	$(\frac{1}{2})^1 = \frac{1}{2}$
2	$(\frac{1}{2})^2 = \frac{1}{4}$



4. 作 $y = \log_2 x$ 圖形

三、填充題：

- 指數函數 $f(x) = a^x$ 一定通過 (0, 1) 的點
- $\log_{10} x = 3.8$ 則 x 為 (4) 位數
- 常用對數是以 10 為底數的對數。

四、 $\log 2 = 0.3010$, $\log 3 = 0.4771$, $\log 5 = 0.6990$

$$\text{求 } \log_3 5 = \frac{\log 5}{\log 3} = \frac{0.6990}{0.4771}$$

五、將下列各數化為科學記號並求其對數

- $1.48 = 1.48 \times 10^0$
- $21500 = 2.15 \times 10^4$
- $0.00324 = 3.24 \times 10^{-3}$
- 求 $\log 1.48 = 0.1703$
- 求 $\log 21500 = \log 2.15 \times 10^4 = \log 2.15 + 4 = 0.3324 + 4 = 4.3324$
- 求 $\log 0.00324 = \log 3.24 \times 10^{-3} = \log 3.24 + (-3) = 0.5105 + (-3) = -2.4895$