

## How to read Math 2012

(取材自「這些用英語您會說嗎？」保江邦夫著，李伯紀譯，建興文化)

\* 畫線的字要一口氣唸完。

1.  $ax^2 + bx + c = 0$

a x squared plus b x plus c equals zero.

2. (a)  $x^2 - c^2 = (x + c)(x - c)$

x squared minus c squared equals x plus c times x minus c.

(b) 比較： $x + cx - c$ ：x plus c x minus c.

3.  $y > f(x)$ : y is greater than f of x.

$y < f(x)$ : y is less than f of x.

4.  $\frac{a+b}{2} \geq \sqrt{ab}$

a plus b over two is greater than or equal to the square root of a b.

5.  $a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$

a cubed plus or minus b cubed equals a plus or minus b times a squared minus or plus a b plus b squared.

6.  $x^n$ : x to the n.  $x^{-n}$ : x to the minus n.  $x^{m-n}$ : x to the m minus n.

7.  $p(x) = \sum_{k=0}^n a_k x^k$

p of x equals the sum from k equals zero to n of a sub k times x to the k. (or polynomial function of p of x).

8.  $\sin A + \sin B = 2 \sin\left(\frac{A+B}{2}\right) \cos\left(\frac{A-B}{2}\right)$

Sine A plus sine B equals two sine of A plus B over two, times cosine of A minus B over two.

9.  $\sin 3A = 3 \sin A - 4 \sin^3 A$

Sine three A equals three sine A minus four sine cubed A.

10.  $y = e^x$ : y equals the exponential x. y equals the exponential of x.

Or, y equals e to the x.

11.  $\sinh x$ : hyperbolic sine of  $x$ .  $\cosh x$ : hyperbolic cosine of  $x$ .  
 $\tanh x$ : hyperbolic tangent of  $x$ .  $\coth x$ : hyperbolic cotangent of  $x$ .

12.  $y = \log x, (\forall x > 0)$ :  $y$  equals log  $x$  for all positive  $x$ .

$y = \ln x, (\forall x > 0)$ :  $y$  equals natural log  $x$  for all positive  $x$ .

13.  $f' = \frac{df(x)}{dx}$ :  $f$  prime equals  $d f$  of  $x$   $d x$ . Or,

$f$  prime equals  $d f$  of  $x$  by  $d x$ .

$$f''(x) = \frac{d^2 f(x)}{dx^2}:$$

$f$  double prime of  $x$  equals  $d$  squared  $f$  of  $x$   $d x$  squared. Or,  
 $f$  double prime of  $x$  equals  $d$  squared  $f$  of  $x$  by  $d x$  squared.

$$f'''(x) = \frac{d^3 f(x)}{dx^3}:$$

$f$  triple prime of  $x$  equals  $d$  cubed  $f$  of  $x$   $d x$  cubed. Or,  
 $f$  triple prime of  $x$  equals  $d$  cubed  $f$  of  $x$  by  $d x$  cubed.

14.  $\int \tan x dx = -\log |\cos x| + C$

The integral of tangent  $x$   $d x$  equals minus log of the absolute value of cosine  $x$  plus constant.

15.  $\int_a^c f(x) dx = \int_a^b f(x) dx + \int_b^c f(x) dx$

The integral from  $a$  to  $c$  of  $f$  of  $x$   $d x$  equals the integral from  $a$  to  $b$  of  $f$  of  $x$   $d x$  plus the integral from  $b$  to  $c$  of  $f$  of  $x$   $d x$ .

16.  $\frac{\partial f(x, y)}{\partial x}$ : partial  $f$  of  $x$   $y$  by partial  $x$ .

$$\frac{\partial^2 f(x, y)}{\partial x \partial y} = f_{xy}(x, y)$$

partial squared  $f$  of  $x$   $y$  by partial  $x$  partial  $y$  equals  $f$  sub  $x$   $y$  of  $x$   $y$ .  
 Or, the second partial of  $f$  of  $x$   $y$  with respect to  $x$  and  $y$  equals  $f$  sub  $x$   $y$  of  $x$   $y$ .

17.  $\vec{u} \cdot \vec{v} = |\vec{u}| |\vec{v}| \cos \theta :$

U dot v equals the norm of u times the norm of v times cosine theta. Or, the inner product of u and v equals the norm of u times the norm of v times cosine theta.

18.  $\vec{u} \cdot \vec{v} = \sum_{k=1}^3 u_k v_k$

U dot v equals the sum from k equals one to three of u sub k times v sub k.

19.  $\vec{u} \times \vec{v} :$  u cross v. Or, the vector product of u and v.

20.  $(u_1, u_2, u_3) \begin{pmatrix} v_1 \\ v_2 \\ v_3 \end{pmatrix}$

The one by three matrix u sub one, u sub two, u sub three, times the three by one matrix v sub one, v sub two, v sub three.

Or, The row vector u sub one, u sub two, u sub three, times the column vector v sub one, v sub two, v sub three.