

How to write math in emails and plain text v1.1

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We will often need to write math using plain text, such as in emails. This page lists some of the standard ways to write equations and symbols, so that we can communicate more clearly.

- **Operations.** Use these symbols for standard arithmetic and operations:

Operation	Text	Example	Comment
Addition	+	$5 + 3 = 8$	
Subtraction	-	$5 - 3 = 2$	
Multiplication	*	$5*3 = 15$	Shift-8 – <i>Never</i> use x for multiplication
Division	/	$6/2 = 3$	
Exponents	^	x^2	Shift-6, called a “caret”
Subscripts	_	(x_0, y_0)	Shift-dash, an underscore
Square roots	sqrt(x) or x^(1/2)	sqrt(x^2+1)	For bigger roots, use exponents instead
Derivatives	', ", etc. or (dy/dx)	$y'' + y = 0$	Single quote (never use a double quotation mark) Use this if the variable is unclear.
Integrals	int{a to b}	$\int_a^b f(x) dx$	Be careful to include the dx!
Inequalities	<, <=, >=, >	$x <= 3$	Don't use => ; it means “implies”

- **Special functions and symbols.** Most special functions like sin, cos, etc. are spelled as they are in textbooks. Always put parentheses around the arguments: `sin(x)`, not `sin x`. Spell out any special symbols which aren't on a standard keyboard. Examples:

`sin(x)` `cos(x)` `tan(x)` `ArcSin(x)` `ln(x)` `pi` `alpha`

- **Use tons of parentheses.** Use them around exponents, around numerators and denominators of fractions, and anywhere else where there could be any confusion. Always close an open parenthesis!
- **Use space and new lines.** Put space between functions, variables, operators, etc. Don't cram multiple equations together – put each one on a new line. Put a blank line between equations.

- **Examples.**

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| <p>1. – Goal: $\sin(2x)$
– Wrong: $\sin 2x$
– Right: $\sin(2x)$</p> <p>2. – Goal: $\frac{2x+1}{3x^2-4}$
– Wrong: $2x+1/3x^2-4$
– Right: $(2x+1)/(3x^2-4)$</p> <p>3. – Goal: $\int_0^t \sin(x^2) dx$
– Wrong: $\text{int}_0^t \sin x^2$
– Right: $\text{int}\{0 \text{ to } t\} \sin(x^2) dx$</p> | <p>4. – Goal: e^{x^2}
– Wrong: e^x^2
– Right: $e^(x^2)$</p> <p>5. – Goal: $y'' + \frac{1}{x}y = 0$
– Wrong: $y''+1/xy = 0$
– Right: $y'''+(1/x)y = 0$</p> <p>6. – Goal: $e^2 \cos(x)$
– Wrong: $e^2 x \cos x$
– Right: $(e^2)*\cos(x)$</p> |
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- **Extended example.** Here's a good example of how to compose an entire email which involves math:

David,

I have a question about problem #4 in the homework.

The problem is to solve a differential equation which simplifies to:

$$dy/y = (x+2)/(x^2 + 2x + 1) dx$$

To use separation of variables, I need to do the integral:

$$\int (x+2)/(x^2 + 2x + 1) dx$$

I think I should use partial fractions, however when I factor, I get this:

$$x^2 + 2x + 1 = (x+1)^2$$

Which way should I decompose this? Here's what I think I should do:

$$A/(x+1) + (Cx + D)/(x+1)^2$$

but I'm not sure if the numerators are right.

Also, should I square the second denominator, or just leave it as (x+1)?

Thanks,

David