Suppose in a graphical calculator exam you're asked to find information on the straight line passing through points $(^1/_3, 2)$ and $(1, {}^-6)$

Here's a neat trick.

On your TI-83 enter STAT / Edit.

In L1 enter $^1/_3$ and 1

In L2 enter 2 and $^-6$

Press STAT /CALC/LinReg

Voila. The equation appears

y = ax+b

a = $^-12$
b = 6

That is the gradient is $^-12$
the equation is y = $^-12x + 6$
and the y-intercept is 6

To find the x intercept
set y = 0
ie 12x = 6
So the x intercept is ½ which is the solution of the equation.

The examiner probably wanted you first to find the gradient and then substitute back into either point, which is painful.

Even without a TI-83 you'd be better to use

$(y - y_1) / (y_2 - y_1) = (x - x_1) / (x_2 - x_1)$

To ensure no substitution slip ups make a little table

x_1	y_1	x_2	y_2
$^1/_3$	2	1	$^-6$

Now insert the values

$(y - 2) / ({}^-6 - 2) = (x - {}^1/_3) / (1 - {}^1/_3)$

Multiply all terms RHS by 3

$^{(y-2)}/_{-8} = {}^{(3x-1)}/_2$

Cross multiply

$2y = {}^-24x + 12$

$y = {}^-12x + 6$

but you already knew that.

✍ *rg*