Extra Example ***Section 3-6*** Oct 15

If 1/3 is a zero of $f(x) = 9x^5 - 9x^4 - 13x^3 - x^2 - 22x + 8$,

a) find all zeros: $2, \frac{1}{3}, \pm i, -\frac{4}{3}$

$\frac{1}{3}$ | 9 -9 -13 -1 -22 8
3 -2 -5 -2 -8
9 -6 -15 -6 -24 | 0

$\div 3\ (9x^4 - 6x^3 - 15x^2 - 6x - 24)$
$3x^4 - 2x^3 - 5x^2 - 2x - 8$

2 | 3 -2 -5 -2 -8
6 8 6 8
3 4 3 4 | ☺

$(3x^3 + 4x^2) + (3x + 4)$
$x^2(3x+4) + 1(3x+4)$
$(x^2+1)(3x+4) = 0$
$\pm i, -4/3$

$\frac{c}{b} = \pm(8, 4, 2, 1)$
$\pm(3, 1)$

$\frac{c}{b} = \pm\left(\frac{8}{3}, 8, \frac{4}{3}, 4, \frac{2}{3}, 2, \frac{1}{3}, 1\right)$

b) write f(x) in factored form with linear factors

$f(x) = (3x-1)(x-2)(3x+4)(x-i)(x+i)$

$x = 1/3$ (2) $x = -4/3$ i $-i$

$3x = 1$
$3x - 1 = 0$

$x^2 - i^2$
$(x^2 + 1)$

c) graph f(x)

x	y
-1	$(-4)(-3)(1)(2) = 24$
0	8
1	$2(-1)(7)(2) = -28$