3.4 1) $(4-i)^3 = 4^3 - 3\cdot 4^2\, i + 3\cdot 4\, i^2 - i^3 = 64 - 48\, i - 12 + i = 52 - 47\, i$

2) $27\, q^2 + 4\, p^3 = 27\cdot(-104)^2 + 4\cdot(-51)^3 = -238\ 572 < 0$

$-\frac{-238\ 572}{27} = 8836 = 94^2$

$a^3 = -\frac{-104}{2} - \frac{1}{2}\cdot 94\, i = 52 - 47\, i = (4-i)^3$

Posons $a = 4 - i$.

$b = \frac{p}{-3\, a} = \frac{-51}{-3\,(4-i)} = \frac{17}{4-i} = \frac{17\,(4+i)}{(4-i)\,(4+i)} = \frac{68+17\, i}{17} = \frac{68}{17} + \frac{17}{17}\, i = 4 + i$

$x_1 = a + b = (4-i) + (4+i) = 8$

$x_2 = a\, j + b\, j^2 = (4-i)\left(-\frac{1}{2} + \frac{\sqrt{3}}{2}\, i\right) + (4+i)\left(-\frac{1}{2} - \frac{\sqrt{3}}{2}\, i\right) =$

$= -2 + 2\sqrt{3}\, i + \frac{1}{2}\, i + \frac{\sqrt{3}}{2} - 2 - 2\sqrt{3}\, i - \frac{1}{2}\, i + \frac{\sqrt{3}}{2} = -4 + \sqrt{3}$

$x_3 = a\, j^2 + b\, j = (4-i)\left(-\frac{1}{2} - \frac{\sqrt{3}}{2}\, i\right) + (4+i)\left(-\frac{1}{2} + \frac{\sqrt{3}}{2}\, i\right) =$

$= -2 - 2\sqrt{3}\, i + \frac{1}{2}\, i - \frac{\sqrt{3}}{2} - 2 + 2\sqrt{3}\, i - \frac{1}{2}\, i - \frac{\sqrt{3}}{2} = -4 - \sqrt{3}$