ALGEBRA HL ④

(1) Given that one of the roots is an integer, solve the equation

$$6x^3 - 29x^2 + 36x - 9 = 0$$

(2) Express $x^2 + 10x + 32$ in the form $(x+a)^2 + b$

(3) $x+p$ is a factor of both $ax^2 + b$ and $ax^2 + bx - ac$.

(i) Show that $p^2 = -\frac{b}{a}$ and that $p = \frac{-b - ac}{b}$

(ii) Hence show that $p^2 + p^3 = c$

HINTS

(1) Trial and error to find first root
(ie whole no. that "works" in the eqn)

Then divide $(x - \text{this root})$ into the cubic

etc.

(2) If you've forgotten then look up "completing the square" in the quadratics section.

(3)(i) $(x+p)(\text{STUFF}) = ax^2 + \ldots$

work this out
Multiply out brackets
Compare coefficients.

$(x+p)(\text{STUFF}) = ax^2 + bx + c$

work this out
Multiply out brackets
Compare coefficients & use answer from 1st bit.

(ii) $p^2 + p^3$

$= p^2 + p^2 \cdot p$

Use results from part (i)

etc