Example #3:

a) Determine an equation, in simplified form, for the family of cubic functions with zeros .

2 and $4\pm\sqrt{3}$

b) Determine an equation for the member of the family whose graph passes through the point (1, –18).

$y = a(x-2)(x-(4+\sqrt{3}))(x-(4-\sqrt{3}))$

$= a(x-2)(x-4-\sqrt{3})(x-4+\sqrt{3})$

$= a(x-2)(x^2-4x+\cancel{\sqrt{3}x}-4x+16-\cancel{4\sqrt{3}}-\cancel{\sqrt{3}x}+\cancel{4\sqrt{3}}-3)$

$= a(x-2)(x^2-8x+13)$

$= a(x^3-8x^2+13x$
$\quad -2x^2+16x-26)$

$y = a(x^3-10x^2+29x-26)$

b) Sub (1, -18)

$-18 = a(1^3-10(1)^2+29(1)-26)$

$-18 = a(-6)$

$3 = a$

$\therefore y = 3(x^3-10x^2+29x-26)$

OR

$y = 3x^3-30x^2-87x-78$

Homework: pg 120; # 7, 9, 10, 11, 12, 15, 19