Pre HL Exit slip #3 Answers.

#1. $a(x-(2-3i))(x-(2+3i))(x-2)(x-1) = f(x)$ [Quartic Equation].

$\Rightarrow (x-2+3i)(x-2-3i) = (x-2)^2 - (3i)^2 = x^2-4x+4+9 = x^2-4x+13$

$\Rightarrow (x-2)(x-1) = x^2-3x+2$.

$\Rightarrow a[(x^2-4x+13)(x^2-3x+2)] = f(x) \quad \Leftarrow (0,5)$

$5 = a[13\cdot 2] \Rightarrow a = \frac{5}{26}$

14
13

$f(x) = \frac{5}{26}[x^4 - 3x^3 + 2x^2 - 4x^3 + 12x^2 - 8x + 13x^2 - 39x + 26]$

$= \frac{5}{26}[x^4 - 7x^3 + 27x^2 - 47x + 26]$

$= \frac{5}{26}x^4 - \frac{35}{26}x^3 + \frac{135}{26}x^2 - \frac{235}{26}x + 5$

#2. $\left.\begin{array}{l} p: 8 \Rightarrow \pm 1, \pm 2, \pm 4, \pm 8 \\ q: 2 \Rightarrow \pm 1, \pm 2 \end{array}\right) \Rightarrow \frac{p}{q} \in \{\pm 1, \pm 2, \pm 4, \pm 8, \pm \frac{1}{2}\}$

#3. $f(x) = k(x+1)(x-2)^2(x-3) \quad \Leftarrow (0,-4)$

$-4 = k(1)(-2)^2(-3) \Rightarrow k = \frac{-4}{-12} = \frac{1}{3}$.

$f(x) = \frac{1}{3}(x+1)(x-2)^2(x-3)$

#4. $p(x) = (x^2+1)(x^2+x-1) + ax + b$.

$p(2) = -6 \Rightarrow -6 = (2^2+1)(2^2+2-1) + 2a + b$

$\Rightarrow -6 = 5(5) + 2a + b$

$\Rightarrow 2a + b = -31$

$p(-1) = 5 \Rightarrow 5 = (1+1)(1-1-1) - a + b$

$5 = -2 - a + b$

$\Rightarrow -a + b = 7$

Solve system. $3a = -38$ $\left(a = \frac{-38}{3} \quad b = \frac{-17}{3}\right)$

$b = 7 + a$

$= 7 - \frac{38}{3}$

$= \frac{21}{3} - \frac{38}{3}$

$p(x) = (x^2+1)(x^2+x-1) - \frac{38}{3}x - \frac{17}{3}$