pre HL ch 6 IB Questions Answers.

#1. Sum: $\frac{45}{9} = \boxed{5}$

Product: $\boxed{\frac{40}{9}}$

#2. $2+i \Rightarrow \boxed{2-i} = x \Rightarrow (x-(2+i))(x-(2-i))$

$= [(x-2)-i][(x-2)+i]$

$= x^2 - 4x + 4 + 1 = \boxed{x^2 - 4x + 5}$

$$\begin{array}{r} x-2 \\ x^2-4x+5 \overline{)\, x^3-6x^2+13x-10} \\ -(x^3-4x^2+5x) \\ \hline -2x^2+8x-10 \\ -2x^2+8x-10 \\ \hline 0 \end{array}$$

$\boxed{x=2}$

#3. $f(2) = f(-1)$

$(2)^3 + 3(2)^2 + 2a + b = (-1)^3 + 3(-1)^2 + a(-1) + b$

$8 + 12 + 2a = -1 + 3 - a$

$3a = 2 - 20 = -18$ $\boxed{a = -6}$

#4. (a) i Sum: $\boxed{-\frac{1}{2}}$

ii product: $\boxed{-18}$

(b) $q(x) = 2(x+4)^3 + (x+4)^4 - 26(x+4)^3 + 13(x+4)^2 + 72(x+4) + 36$

$= 2(x^5 + \boxed{5x^4(4)} + 10x^3(4)^2 \dots) + \boxed{(x^4} + 4x^3 \dots) \dots$

Sum: $-\frac{4!}{2}$ $\Leftarrow -\frac{2 \cdot 5 \cdot 4 + 1}{2}$

#5. $P(x) = 3x^3 + ax + b$

$P(2) = 3\cdot 2^3 + 2a + b = 2 \Rightarrow \boxed{2a+b=-22}$ (24)

$P(-1) = -3 - a + b = 5 \Rightarrow \boxed{-a+b=8}$

Solve the system.

$3a = -30$

$\boxed{a=-10}$

$b = 8 + a$

$\boxed{b=-2}$

#6. $5x^3 + 48x^2 + 100x + 2 - a = 0$

$r_1 + r_2 + r_3 = -\frac{48}{5}$

$r_1 r_2 r_3 = \frac{-(2-a)}{5}$

$\Rightarrow \frac{-48}{5} + \frac{(a-2)}{5} = 0$

$-48 + a - 2 = 0 \Rightarrow \boxed{a=50}$

#7. (i) $P(1) = 2 - 1 - 2 + 1 = 0$

(ii)

	2	−1	−2	1
1		2	1	−1
	2	1	−1	0

$\Rightarrow 2x^2 + x - 1 = 0 \Rightarrow (2x-1)(x+1) = 0$

$2x - 1$, $x + 1$

$\boxed{x=-1}$ $\boxed{x=\frac{1}{2}}$

#8. $P(x) = Ax^3 + Bx^2 + x + 6 \Rightarrow P(-1) = -A + B - 1 + 6 = 0$

$\boxed{-A+B=-5}$

$\Rightarrow P(2) = 8A + 4B + 2 + 6 = 0$

$8A + 4B = -8$

$\boxed{2A+B=-2}$

$3A = 3$ $\boxed{A=1}$

$B = -5 + A = \boxed{-4}$

#9. $f(2) = 15$

$(2)^4 + 3(2)^3 + p(2)^2 - 2(2) + q = 15$

$4p + q = 15 - 36 = -21$

$\boxed{4p+q=-21}$

$f(-3) = 0$

$(-3)^4 + 3(-3)^3 + p(-3)^2 - 2(-3) + q = 0$

$\boxed{9p+q=-7}$

$-5p = -15$ $\boxed{p=3}$ $\boxed{q=-33}$