1. If $x^2 - 3 = 2\sqrt{2}$
   a. Find the value of x.
   b. Find the value of $x^4 + \frac{1}{x^4}$
   c. Find the value of $x^5 + \frac{1}{x^5}$.

2. If $a + b = \sqrt{7}$ and $a - b = \sqrt{5}$
   a. Find the value of $(a^2 - b^2)^2$
   b. Prove that: $8ab(a^2 + b^2) = 24$.
   c. If $a + b + c = m$, $a^2 + b^2 + c^2 = n$ and $a^3 + b^3 + c^3 = p^3$ show that $m^3 + 2p^3 = 3mn$ where $c = 0$.

3. $b + \frac{1}{b} = 5$, $p^4 = 119 - \frac{1}{p^4}$.
   a. Resolve into factors: $m^4 - 7m^2 + 1$.
   b. Show that: $\frac{b^8 - 1}{b^4} = 115\sqrt{21}$.
   c. Prove that: $p^6 - 1 - 36p^3 = 0$.

4. Sum of a number and its multiplicative inverse is 3.
   a. If the number is x, express the above information by an equation.
   b. Find the value of $x^3 - \frac{1}{x^3}$
   c. Prove that $x^5 + \frac{1}{x^5} = 123$.

5. If $a = \sqrt{6} + \sqrt{5}$
   a. Find the value of $a + \frac{1}{a}$.
   b. Determine the value of $p^3 + \frac{1}{p^3}$.
   c. Determine the value of $p^6 + \frac{1}{p^6}$.

Question ▶ 11 $x^2 = 5 + 2\sqrt{6}$, $a + b + c = m$

$a^2 + b^2 + c^2 = n$ and $a^3 + b^3 = p^3$ [Ctg. B. 17]

a. Find the value of x.   2

b. Prove that $\frac{x^8 + 1}{x^4} = 98$.   4

c. If $C = 0$ then show that $m^3 + 2p^3 = 3mn$.   4

Question ▶ 12 $x^2 + \dfrac{1}{x^2} = 10$.

a. Find the value of $x + \dfrac{1}{x}$. 　　　　2

b. Prove that, $\dfrac{x^8 - 1}{x^4} = 40\sqrt{6}$ 　　　　4

c. Find the value of $x^5 - \dfrac{1}{x^5}$. 　　　　4

Question ▶ 1 $y = 5 + 2\sqrt{6}$ and $x^2 + \dfrac{1}{x^2} = \dfrac{82}{9}$. 　　[D.B. 19]

a. Resolve into factors : $m^3 - 3m^2 + 3m - 2$. 　　　2

b. Find the value of $y^4 + \dfrac{1}{y^4}$. 　　　4

c. Prove that, $27\left(x^3 - \dfrac{1}{x^3}\right) = 728$. 　　　4