

$$p = 4x^4 + 3x^3 + 2x^2 + x \quad q = 7x^2 + 6x + 5$$

$$p + q = 4x^4 + 3x^3 + 9x^2 + 7x + 5$$

$$p - q = 4x^4 + 3x^3 - 5x^2 - 5x - 5$$

$$P = x^4 + x^3 - 3x^2 - 3x + 7 \quad Q = x^2 + x - 2$$

$$\frac{P}{Q} = \frac{x^4 + x^3 - 3x^2 - 3x + 7}{x^2 + x - 2}$$

dividend: $x^4 + x^3 - 3x^2 - 3x + 7$

divisor: $x^2 + x - 2$

quotient: $x^2 - 1$

rest: $-2x + 5$

$$\begin{array}{r} x^4 + x^3 - 3x^2 - 3x + 7 \\ \hline -x^4 - x^3 + 2x^2 \\ \hline -x^2 - 3x + 7 \\ \hline x^2 + x - 2 \\ \hline -2x + 5 \end{array} \left| \begin{array}{r} x^2 + x - 2 \\ x^2 - 1 \end{array} \right.$$

$$r = -\lambda^3 + 6\lambda^2 - 11\lambda + 6 = (\lambda - 2)(-\lambda^2 + 4\lambda - 3)$$

$$\begin{array}{c|ccc|c} & -1 & 6 & -11 & 6 \\ & \downarrow & -2 & 8 & -6 \\ \hline 2 & -1 & 4 & -3 & 0 \end{array}$$

$$-\lambda^3 + 6\lambda^2 - 11\lambda + 6$$