

ex.9 求 $q(x)$, $r(x)$

1) $(x^5+1) \div (x+1)$

$$\begin{array}{r} x^4 - x^3 + x^2 - x + 1 \\ x+1 \overline{) x^5 + 0x^4 + 0x^3 + 0x^2 + 0x + 1} \\ \underline{x^5 + x^4} \\ -x^4 + 0x^3 \\ \underline{-x^4 - x^3} \\ x^3 + 0x^2 \\ \underline{x^3 + x^2} \\ -x^2 + 0x \\ \underline{-x^2 - x} \\ x + 1 \\ \underline{x + 1} \\ 0 \end{array}$$

$q(x) = x^4 - x^3$

$+x^2 - x + 1 \#$

$r(x) = 0 \#$

2) $(5x^4 - 7x^3) \div (3x^2)$

$$\begin{array}{r} \frac{5}{3}x^2 - \frac{7}{3}x + 0 \\ 3x^2 \overline{) 5x^4 - 7x^3 + 0x^2 + 0x + 0} \\ \underline{5x^4} \\ -7x^3 \\ \underline{-7x^3} \\ 0x^2 \\ \underline{0x^2} \\ 0x + 0 \end{array}$$

$q(x) = \frac{5}{3}x^2 - \frac{7}{3}x$

$r(x) = 0 \#$

3) $(x^4 + 4x^3 + 4x^2 + 3x + 2) \div (x^2 - x + 1)$

$$\begin{array}{r} x^2 + 5x + 8 \\ x^2 - x + 1 \overline{) x^4 + 4x^3 + 4x^2 + 3x + 2} \\ \underline{x^4 - x^3 + x^2} \\ 5x^3 + 3x^2 + 3x \\ \underline{5x^3 - 5x^2 + 5x} \\ 8x^2 - 2x + 2 \\ \underline{8x^2 - 8x + 8} \\ 6x - 6 \end{array}$$

$q(x) = x^2 + 5x + 8 \#$

$r(x) = 6x - 6 \#$

4) $(6x^5 + 15x^4 + 8x^3 + 10x^2 + 10x + 1) \div (2x^3 + x^2 + 3x + 1)$

$$\begin{array}{r} 3x^2 + 6x - \frac{7}{2} \\ 2x^3 + x^2 + 3x + 1 \overline{) 6x^5 + 15x^4 + 8x^3 + 10x^2 + 10x + 1} \\ \underline{6x^5 + 3x^4 + 9x^3 + 3x^2} \\ 12x^4 - x^3 - 3x^2 + 10x \\ \underline{12x^4 + 6x^3 + 18x^2 + 6x} \\ -7x^3 - 21x^2 + 4x + 1 \\ \underline{-7x^3 - \frac{7}{2}x^2 - \frac{21}{2}x - \frac{7}{2}} \\ -\frac{35}{2}x^2 + \frac{29}{2}x + \frac{9}{2} \end{array}$$

$q(x) = 3x^2 + 6x - \frac{7}{2} \#$

$r(x) = -\frac{35}{2}x^2 + \frac{29}{2}x + \frac{9}{2} \#$