20.4 1)

$$\begin{array}{l|l}
\cancel{x^3}+\alpha x^2+x-3 & \underline{x^2-x+2} \\
\cancel{-x^3}+x^2-2x & x+\alpha+1 \\
\underline{\cancel{(\alpha+1)x^2}-x-3} & \\
\cancel{-(\alpha+1)x^2}+(\alpha+1)x-2\alpha-2 & \\
\underline{\qquad\qquad\qquad} & \\
\alpha x-2\alpha-5 &
\end{array}$$

Επομένως $x^3+\alpha x^2+x-3=(x^2-x+2)(x+\alpha+1)+\alpha x+2\alpha-1$

20.4 2)

$$\begin{array}{l|l}
x^3+2x^2+\alpha x-2 & \underline{x^2+x+1} \\
\underline{-x^3-x^2-x} & x+1 \\
x^2+(\alpha-1)x-2 & \\
\underline{-x^2-x-1} & \\
(\alpha-2)x-3 &
\end{array}$$

Επομένως $x^3+2x^2+\alpha x-2=(x^2+x+1)(x+1)+(\alpha-2)x-3$

20.4 3)

$$\begin{array}{l|l}
x^3+\alpha x^2-x+5 & \underline{x^2+x+2} \\
\underline{-x^3-x^2-2x} & x+(\alpha-1) \\
(\alpha-1)x^2-3x+5 & \\
\underline{-(\alpha-1)x^2-(\alpha-1)x-2\alpha+2} & \\
(-\alpha-2)x-2\alpha+7 &
\end{array}$$

Επομένως $x^3+\alpha x^2-x+5=(x^2+x-2)(x+\alpha-1)+(-\alpha-2)x-2\alpha+7$

20.4 4)

$$\begin{array}{l|l}
x^3+\alpha x^2-2\alpha x+4 & \underline{x^2-x+1} \\
\underline{-x^3+x^2-x} & x+\alpha+1 \\
(\alpha+1)x^2-(2\alpha+1)x+4 & \\
\underline{-(\alpha+1)x^2+(\alpha+1)x-\alpha-1} & \\
-\alpha x-\alpha+3 &
\end{array}$$

Επομένως $x^3+\alpha x^2-2\alpha x+4=(x^2-x+1)(x+\alpha+1)-\alpha x-\alpha+3$

20.4 5)

$$\begin{array}{r|l} x^3+(\alpha+2)x^2-\alpha x-3 & x^2-x-2 \\ \underline{-x^3+x^2+2x} & \\ (\alpha+3)x^2+(2-\alpha)x-3 & x+\alpha+3 \\ \underline{-(\alpha+3)x^2+(3+\alpha)x+2\alpha+6} & \\ 5x+2\alpha+3 & \end{array}$$

Επομένως $x^3+(\alpha+2)x^2-\alpha x-3=(x^2-x-2)(x+\alpha+3)+5x+2\alpha+3$

20.4 6)

$$\begin{array}{r|l} 2x^3-(\alpha+1)x^2+\alpha x+1 & x^2-x+3 \\ \underline{-2x^3+2x^2-6x} & \\ (-\alpha+1)x^2+(\alpha-6)x+1 & 2x-\alpha+1 \\ \underline{-(-\alpha+1)x^2+(-\alpha+1)x+3\alpha-3} & \\ -5x+3\alpha-2 & \end{array}$$

Επομένως $2x^3-(\alpha+1)x^2+\alpha x+1=(x^2-x+3)(2x-\alpha+1)-5x+3\alpha-2$