Homework 4 Solutions

6. $P(x) = 6x^4 - 2x^3 + 29x^2 - 7x + 28$ and $d(x) = 2x^2 + 7$, so we have

$$
\begin{array}{r|rrrrr}
 & & & 3x^2 & -x & +4 \\
\hline
2x^2+7 & 6x^4 & -2x^3 & +29x^2 & -7x & +28 \\
 & -6x^4 & & -21x^2 & & \\
\cline{2-4}
 & & -2x^3 & +8x^2 & -7x & \\
 & & 2x^3 & & +7x & \\
\cline{3-5}
 & & & 8x^2 & & +28 \\
 & & & -8x^2 & & -28 \\
\cline{4-6}
 & & & & & 0
\end{array}
$$

Therefore, $P(x) = (3x^2 - x + 4)(2x^2 + 7)$.

22. $P(x) = (x + 5)(x + 1)(x - 3)$ (There are many others, but this is the simplest.)