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a)

$$\begin{array}{r} 2x^2 - 2x + 5 \\ - 2x^2 \phantom{+ 6} \\ \hline \phantom{2x^2} - 2x + 11 \end{array}$$

$$\frac{x^2 - 3}{2}$$

$$\frac{2x^2}{x^2} = 2$$

$$\bullet 2x^2 - 2x + 5 = 2 \cdot (x^2 - 3) - 2x + 11$$

$$\bullet (2x^2 - 2x + 5) : (x^2 - 3) = 2 + \frac{(-2x + 11)}{x^2 - 3}$$

b)

$$\begin{array}{r} 3x^2 - 7x - 4 \\ - 3x^2 - 6x + 9 \\ \hline \phantom{3x^2} - 13x + 5 \end{array}$$

$$\frac{x^2 + 2x - 3}{3}$$

$$\frac{3x^2}{x^2} = 3$$

$$\bullet 3x^2 - 7x - 4 = 3 \cdot (x^2 + 2x - 3) - 13x + 5$$

$$\bullet \frac{3x^2 - 7x - 4}{x^2 + 2x - 3} = 3 + \frac{(-13x + 5)}{x^2 + 2x - 3}$$

c)

$$\begin{array}{r}
 5x^3 + 3x^2 - 2x + 4 \\
 \underline{-5x^3 - 5x^2 - 5x} \\
 -2x^2 - 7x + 4 \\
 \underline{+2x^2 + 2x + 2} \\
 -5x + 6
 \end{array}$$

$$\begin{array}{r}
 \underline{x^2 + x + 1} \\
 5x - 2
 \end{array}$$

$$\begin{array}{r}
 \frac{5x^3}{x^2} = 5x \\
 \frac{-2x^2}{x^2} = -2
 \end{array}$$

•  $5x^3 + 3x^2 - 2x + 4 = (x^2 + x + 1)(5x - 2) - 5x + 6$

•  $\frac{5x^3 + 3x^2 - 2x + 4}{x^2 + x + 1} = 5x - 2 + \frac{-5x + 6}{x^2 + x + 1}$

d)

$$\begin{array}{r}
 -x^4 + 4x^2 + 10 \\
 \underline{+x^4 + 2x^3} \\
 2x^3 + 4x^2 + 10 \\
 \underline{-2x^3 - 4x^2} \\
 0
 \end{array}$$

$$\begin{array}{r}
 +10 \\
 \underline{x+2} \\
 -x^3 + 2x^2 \\
 +10 \\
 +10
 \end{array}$$

$$\begin{array}{r}
 \frac{-x^4}{x} = -x^3 \\
 \frac{2x^3}{x} = 2x^2
 \end{array}$$

•  $-x^4 + 4x^2 + 10 = (x+2)(-x^3 + 2x^2) + 10$

•  $\frac{-x^4 + 4x^2 + 10}{x+2} = -x^3 + 2x^2 + \frac{10}{x+2}$