

pl 16: 1

$$\begin{array}{r}
 x^5 - 7x^4 + 3x^2 - 8 \\
 \underline{-x^5 + 3x^4 - x^3} \\
 -4x^4 - x^3 + 3x^2 \\
 \underline{+4x^4 - 12x^3 + 4x^2} \\
 -13x^3 + 7x^2 - 8 \\
 \underline{+13x^3 - 39x^2 + 13x} \\
 -32x^2 + 13x - 8 \\
 \underline{+32x^2 - 96x + 32} \\
 -83x + 24
 \end{array}
 \quad
 \begin{array}{r}
 -8 \mid x^2 - 3x + 1 \\
 \underline{x^3 - 4x^2 - 13x - 32} \\
 - 4x^2 - 13x - 32 \\
 - 13x - 32 \\
 - 32
 \end{array}
 \quad
 \begin{array}{l}
 \frac{x^5}{x^2} = x^3 \\
 \frac{-4x^4}{x^2} = -4x^2 \\
 \frac{-13x^3}{x^2} = -13x \\
 \frac{-32x^2}{x^2} = -32
 \end{array}$$

$$\bullet x^5 - 7x^4 + 3x^2 - 8 = (x^2 - 3x + 1)(x^3 - 4x^2 - 13x - 32) - 83x + 24$$

$$\bullet \frac{x^5 - 7x^4 + 3x^2 - 8}{x^2 - 3x + 1} = x^3 - 4x^2 - 13x - 32 + \frac{-83x + 24}{x^2 - 3x + 1}$$

$$\begin{array}{r}
 6x^4 + 3x^3 - 2x \\
 \underline{-6x^4} \\
 3x^3 - 4x^2 - 2x \\
 \underline{-3x^3} \\
 -4x^2 - 4x \\
 \underline{+4x^2} \\
 -4x + \frac{8}{3}
 \end{array}
 \quad
 \begin{array}{r}
 -2x \mid 3x^2 + 2 \\
 \underline{2x^2 + x - \frac{4}{3}} \\
 x - \frac{4}{3}
 \end{array}
 \quad
 \begin{array}{l}
 \frac{6x^4}{3x^2} = 2x^2 \\
 \frac{3x^3}{3x^2} = x \\
 \frac{-4x^2}{3x^2} = -\frac{4}{3}
 \end{array}$$

$$\bullet 6x^4 + 3x^3 - 2x = (3x^2 + 2) \cdot \left(2x^2 + x - \frac{4}{3}\right) - 4x + \frac{8}{3}$$

$$\bullet \frac{6x^4 + 3x^3 - 2x}{3x^2 + 2} = 2x^2 + x - \frac{4}{3} + \frac{-4x + \frac{8}{3}}{3x^2 + 2}$$

$$\begin{array}{r}
 c) \quad 3x^5 - 2x^4 + 4x - 5 \quad \big| x^3 - 2x + 1 \\
 \underline{-3x^5} \qquad \qquad \qquad +6x^3 - 3x^2 \\
 -2x^4 + 6x^3 - 3x^2 + 4x - 5 \\
 \underline{+2x^4} \qquad \qquad \qquad -4x^2 + 2x \\
 6x^3 - 7x^2 + 6x - 5 \\
 \underline{-6x^3} \qquad \qquad \qquad +12x - 6 \\
 -7x^2 + 18x - 11
 \end{array}$$

$$\begin{array}{l}
 \frac{3x^5}{x^3} = 3x^2 \\
 \frac{-2x^4}{x^3} = -2x \\
 \frac{6x^3}{x^3} = 6
 \end{array}$$

$$\bullet \quad 3x^5 - 2x^4 + 4x - 5 = (x^3 - 2x + 1) \cdot (3x^2 - 2x + 6) - 7x^2 + 18x + 11$$

$$\bullet \quad \frac{3x^5 - 2x^4 + 4x - 5}{x^3 - 2x + 1} = 3x^2 - 2x + 6 + \frac{(-7x^2 + 18x - 11)}{x^3 - 2x + 1}$$

$$\begin{array}{r}
 d) \quad x^4 + 3x^3 + 2 \quad \big| x^4 + 3x \\
 \underline{+x^4} \qquad \qquad \qquad -3x \\
 3x^3 \qquad \qquad \qquad -3x + 2
 \end{array}$$

$$\begin{array}{l}
 \frac{x^4}{x^4} = 1
 \end{array}$$

$$\bullet \quad x^4 + 3x^3 + 2 = 1 \cdot (x^4 + 3x) + 3x^3 - 3x + 2$$

$$\bullet \quad \frac{x^4 + 3x^3 + 2}{x^4 + 3x} = 1 + \frac{3x^3 - 3x + 2}{x^4 + 3x}$$