

3) Use synthetic division to divide $x^3 + 2x^2 - 4x + 1$ by $x - 3$

Solution:

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$$x - 3 = 0$$

$$x = 3$$

$$\begin{array}{r|rrrr} 3 & 1 & 2 & -4 & 1 \\ & \downarrow & 3 & 15 & 33 \\ \hline & 1 & 5 & 11 & 34 \end{array}$$

$$\text{Remainder} = \frac{34}{x-3}$$

$$\text{Quotient} = x^2 + 5x + 11$$

Divide $p(x)$ by $d(x)$

$$p(x) = 4x^3 + 2x^2 - 3x + 5$$

$$d(x) = x + 3$$

Solution:

$$x + 3 = 0$$

$$x = -3$$

$$\begin{array}{r|rrrr} -3 & 4 & 2 & -3 & 5 \\ & \downarrow & -12 & 30 & 81 \\ \hline & 4 & -10 & 27 & 86 \end{array}$$

$$\text{Remainder} = \frac{86}{x+3}$$

$$\text{Quotient} = 4x^2 - 10x + 27$$