

Divide using Synthetic Division *Coefficients*

$$(2x^3 - 7x^2 - 4) \div (x - 3) \quad \begin{array}{l} x-3=0 \\ x=3 \end{array}$$

$$2x^3 - 7x^2 + 0x - 4$$

$$\begin{array}{r|rrrr} 3 & 2 & -7 & 0 & -4 \\ & \downarrow & 6 & -3 & -9 \\ \hline & 2 & -1 & -3 & -13 \end{array} \quad \begin{array}{l} \text{Remainder} \\ \hline \end{array}$$
$$2x^2 - x - 3 - \frac{13}{x-3}$$

Divide

$$(4x^4 + 3x^2 - 5x + 1) \div (x + 2)$$

$$\begin{array}{r|rrrrr} -2 & 4 & 0 & 3 & -5 & 1 \\ & & -8 & 16 & -38 & 86 \\ \hline & 4 & -8 & 19 & -43 & \boxed{87} \end{array}$$

$$4x^3 - 8x^2 + 19x - 43 + \frac{87}{x+2}$$

Is each binomial given a factor of the given polynomial

$$x^4 - 8x^3 + 16x^2 - 23x - 6$$

$$x - 6$$

$$\begin{array}{r|rrrrr} 6 & 1 & -8 & 16 & -23 & -6 \\ & & 6 & -12 & 24 & 6 \\ \hline & 1 & -2 & 4 & 1 & 0 \end{array}$$

Yes $x - 6$ is a factor
of $x^4 - 8x^3 + 16x^2 - 23x - 6$

Is each binomial given a factor of the given polynomial

$$x^5 + 5x^3 + 9x^2 - x + 3$$

$$x + 3$$

$$\begin{array}{r|rrrrrr} -3 & 1 & 0 & 5 & 9 & -1 & 3 \\ & & -3 & 9 & -42 & 99 & -294 \\ \hline & 1 & -3 & 14 & -33 & 98 & -291 \end{array}$$

$x+3$ is Not
a factor

$$x^3 - 10x^2 + 28x - 16$$

$$x - 4$$

$$\begin{array}{r|rrrr} 4 & 1 & -10 & 28 & -16 \\ & & 4 & -24 & 16 \\ \hline & 1 & -6 & 4 & 0 \end{array}$$

Yes $x-4$
is a factor