

Synthetic Division

Ex: $(6x^3 - 19x^2 + x + 6) \div (x - 3)$

$$\begin{array}{r|rrrr} 3 & 6 & -19 & 1 & 6 \\ & & 18 & -3 & -6 \\ \hline & 6 & -1 & -2 & 0 \end{array}$$

$$\Rightarrow \boxed{6x^2 - x - 2}$$

Ex: $\frac{m^3 - 7m + 3m^2 - 21}{m + 3}$

$$\begin{array}{r|rrrr} -3 & 1 & 3 & -7 & -21 \\ & & -3 & 0 & 21 \\ \hline & 1 & 0 & -7 & 0 \end{array}$$

$$\boxed{x^2 - 7}$$

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

Divide Everyone by 2 to make that 1

$$(2x^4 - \frac{5}{2}x^2 + x + 2) \div (x - \frac{1}{2})$$

$$\begin{array}{r|rrrrr} \frac{1}{2} & 2 & 0 & -\frac{5}{2} & 1 & 2 \\ & & 1 & \frac{1}{2} & -1 & 0 \\ \hline & 2 & 1 & -2 & 0 & 2 \end{array}$$

misses x^3 so we need a x^3

$$\boxed{2x^3 + x^2 - 2x + \frac{2}{x - \frac{1}{2}}}$$

or $\boxed{2x^3 + x^2 - 2x + \frac{4}{2x - 1}}$