Division of Polynomials

* Only need to know how to divide a polynomial by a monomial.

Recall: $\frac{A+B}{C} = \frac{A}{C} + \frac{B}{C}$

$\frac{x^m}{x^n} = x^{m-n}$, $x^{-n} = \frac{1}{x^n}$

Ex $\dfrac{6x^3+12x^2-9x}{3x}$

$\dfrac{6x^3}{3x} + \dfrac{12x^2}{3x} - \dfrac{9x}{3x}$

$2x^2+4x-3$

Ex. $\dfrac{12t^5 - 6t^3 + 6t^2}{6t^2}$

$\frac{6}{3} = 2$

$\dfrac{12t^5}{6t^2} - \dfrac{6t^3}{6t^2} + \dfrac{6t^2}{6t^2}$

$2t^3 - t + 1$

Ex $\dfrac{-27r^4+36r^3-6r^2-26r+2}{-3r}$

$\dfrac{-27r^4}{-3r}+\dfrac{36r^3}{-3r}-\dfrac{6r^2}{-3r}-\dfrac{26r}{-3r}+\dfrac{2}{-3r}$

$9r^3-12r^2+2r+\dfrac{26}{3}-\dfrac{2}{3r}$

Ex. If the area of a rectangle is $15x^3+12x^2-9x$ and the width is $3x$, what is the length?

$$\frac{A}{w}=\frac{lw}{w}$$

$$\frac{A}{w}=l$$

$$l=\frac{15x^3+12x^2-9x}{3x}$$

$$l=\frac{15x^3}{3x}+\frac{12x^2}{3x}-\frac{9x}{3x}$$

$$\boxed{l=5x^2+4x-3}$$