

Sec 5-3: Polynomial Division

We'll look at division by a monomial first. It's like simplifying:

$$\frac{6r^2s^2 + 3rs^2 - 9r^2s}{3rs}$$

* split into 3 pieces *

Ex1

$$\frac{6r^2s^2}{3rs} + \frac{3rs^2}{3rs} - \frac{9r^2s}{3rs}$$

$$2rs + s - 3r$$

Ex2

$$\frac{3a^2b + 6a^3b^2 + 18ab}{3ab}$$

$$a + 2a^2b + 6$$

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Ex 3

$$\frac{12xy^2 + 3x}{3x}$$

$$4xy + 1$$

Ex 4

$$\frac{(6xy^2 - 3xy + 2xy^2)}{xy} \cancel{(xy)}$$

$$6y - 3 + 2x$$

$$\frac{c^2 - c - 30}{c - 6}$$

$$\begin{array}{r} c + 5 \\ c - 6 \overline{) c^2 - c - 30} \\ + (c^2 + 6c) \downarrow \\ \hline 5c - 30 \\ - (5c - 30) \\ \hline 0 \end{array}$$

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

$$\begin{array}{r} 2x^3 + x^2 - 2x + \frac{4}{2x-1} \\ (2x-1) \overline{) 4x^4 + 0x^3 - 5x^2 + 2x + 4} \\ - (4x^4 - 2x^3) \downarrow \downarrow \downarrow \\ \hline \end{array}$$

$$\begin{array}{r} 2x^3 - 5x^2 \\ + (2x^3 + x^2) \\ \hline \end{array}$$

$$\begin{array}{r} -4x^2 + 2x \\ - (-4x^2 + 2x) \\ \hline \end{array}$$

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$$\frac{y^5 - 3y^2 - 20}{y - 2}$$

$$\begin{array}{r}
 y^4 + 2y^3 + 4y^2 + 5y + 10 \\
 \hline
 y - 2 \overline{) y^5 + 0y^4 + 0y^3 - 3y^2 + 0y - 20} \\
 \underline{-(y^5 - 2y^4)} \\
 2y^4 + 0y^3 \\
 \underline{-(2y^4 - 4y^3)} \\
 4y^3 - 3y^2 \\
 \underline{+(4y^3 + 8y^2)} \\
 5y^2 + 0y \\
 \underline{-(5y^2 - 10y)} \\
 10y - 20 \\
 \underline{-(10y - 20)} \\
 0
 \end{array}$$

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