

Feb. 15, 2017

Sect. 3-6 a

Dividing Polynomials

Monomials

Long Division

Monomials

$$\frac{2x^2 + 4x - 6}{2} = x^2 + 2x - 3$$

$$(3x^3 - 7x^2 + 2x) \div x$$

$$\frac{3x^3}{x} - \frac{7x^2}{x} + \frac{2x}{x}$$

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

$$\frac{5a^6 + 6a^4 - 7a^3}{a^2}$$

$$\frac{5a^6}{a^2} + \frac{6a^4}{a^2} - \frac{7a^3}{a^2}$$

$$5a^4 + 6a^2 - 7a$$

Long Division

$$\begin{array}{r} 144 \\ 3 \overline{) 432} \\ \underline{-3} \\ 13 \\ \underline{-12} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

Divisor \rightarrow 3 \leftarrow Quotient
 \leftarrow Dividend
 \leftarrow Remainder

$$(x^2 + 5x + 6) \div (x + 2) = x + 3$$

$$\begin{array}{r} x + 3 \\ x + 2 \overline{) x^2 + 5x + 6} \\ \underline{-(x^2 + 2x)} \\ 3x + 6 \\ \underline{-(3x + 6)} \\ 0 \end{array}$$

$\frac{x^2}{x} = x$

$\frac{3x}{x} = 3$

$$(3x^3 - 7x^2 + 9x - 14) \div (x - 2)$$

$$\begin{array}{r}
 3x^2 - x + 7 \\
 x - 2 \overline{) 3x^3 - 7x^2 + 9x - 14} \\
 \underline{3x^3 - 6x^2} \\
 -1x^2 + 9x \\
 \underline{-(-1x^2 + 2x)} \\
 7x - 14 \\
 \underline{+(7x - 14)} \\
 0
 \end{array}$$

$$= 3x^2 - x + 7$$

$$\frac{3x^3}{x} = 3x^2 - (3x^3 - 6x^2)$$

$$\frac{-1x^2}{x} = -1x$$

$$\frac{7x}{x} = 7$$

$$(2x^3 + 2x^2 - 7) \div (x + 3)$$

$$x + 3 \overline{) 2x^3 + 2x^2 + 0x - 7} \quad \begin{array}{l} 2x^2 - 4x + 12 + \\ \frac{-43}{x+3} \end{array}$$

$$\frac{2x^3}{x} = 2x^2 \quad \underline{-(2x^3 + 6x^2)}$$

$$\frac{-4x^2}{x} = -4x \quad \begin{array}{l} -4x^2 + 0x \\ \underline{-(-4x^2 - 12x)} \\ 12x - 7 \end{array}$$

$$\frac{12x}{x} = 12 \quad \begin{array}{l} 12x - 7 \\ \underline{-(12x + 36)} \\ -43 \end{array}$$

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

$$\begin{array}{r}
 x^2 - 1 \overline{) x^3 + 2x^2 - 3x + 1} \\
 \underline{-(x^3 \quad - 1x)} \\
 2x^2 - 2x + 1 \\
 \underline{-(2x^2 \quad - 2)} \\
 -2x + 3
 \end{array}$$

$\frac{x^3}{x^2} = x$
 $\frac{2x^2}{x^2} = 2$

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