



Synthetic Division



Obj: I can divide polynomials using synthetic division.

-Synthetic division

1. $(m^3 + m^2 - 81m - 81) \div (m - 9)$ ← what makes = 0

$$\begin{array}{r|rrrr}
 9 & & & -81 & -81 \\
 & & +9 & +90 & +81 \\
 \hline
 & & 10 & 9 & 0 \text{ remainder}
 \end{array}$$

$$\begin{array}{l}
 m - 9 = 0 \\
 +9 \quad +9 \\
 m = 9
 \end{array}$$

$$m^2 + 10m + 9$$

2. $(2a^3 + 5a - 7) \div (a + 2)$

$$\begin{array}{r|rrrr}
 -2 & 2 & 0 & 5 & -7 \\
 & & -4 & +8 & -26 \\
 \hline
 & 2 & -4 & 13 & -33 \text{ rem.}
 \end{array}$$

$$a + 2 = 0$$

$$a = -2 \text{ shelf}$$

$$2a^2 - 4a + 13 - \frac{33}{a+2}$$



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$$3. \left(\frac{8x^5}{4} - \frac{2x^4}{4} - \frac{16x^2}{4} + \frac{4}{4} \right) \div (4x - 1)$$

$$4x - 1 = 0$$

$$4x = 1$$

$$x = \frac{1}{4}$$

$$\begin{array}{r|rrrrr} \frac{1}{4} & 2 & -\frac{1}{2} & 0 & -4 & 0 & 1 \\ & +\frac{1}{2} & +0 & 0 & -1 & & -\frac{1}{4} \\ \hline & 2 & 0 & 0 & -4 & -1 & \frac{3}{4} = 4 \\ & & & & & & \frac{3}{4} \cdot 4 \\ & & & & & & 3 \cdot 3 \downarrow \end{array}$$

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

$$4. \left(\frac{4y^3}{2} - \frac{6y^2}{2} + \frac{4y}{2} - \frac{1}{2} \right) \div (2y - 1)$$

$$2y - 1 = 0$$

$$y = \frac{1}{2}$$

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

$$2y^2 - 2y + 1$$

CONCEPT CHECK

1. $5y^2 + 13y + 40 + \frac{130}{y-3}$

2. $2y^2 - y + 4 - \frac{5}{2y+1}$



Lessons 1-3

Thurs, Jan 25th

Classwork/Homework

- Unit 5 Lesson 5

Synthetic Division WS



Learning Targets

- I can divide polynomials using synthetic division.