

2.2 Synthetic Division

9/16/19

EX 1: $(1x^3 + 2x^2 - 1x - 2) \div (x - 1)$
 dividing dividing by

Step 1: Set what we are dividing by equal to zero & solve.

$$x - 1 = 0$$

$$\begin{array}{r} +1 \\ +1 \\ \hline \end{array}$$

$$x = 1$$

Step 2: Put that number in a box.

Step 3: Line up

coefficients from what we are dividing next to the box.

$$\begin{array}{r} \boxed{1} \quad | \quad 1 \downarrow \quad 2 \downarrow + \quad -1 \downarrow + \quad -2 \downarrow + \\ \hline 1 \quad 3 \quad 2 \quad \boxed{0} \leftarrow \text{remainder} \\ \hline 1x^2 + 3x + 2 \end{array}$$

Step 4: Add columns & put answer below line.

Step 5: Multiply # below line with # in box. Put answer in next column above line.

Step 6: Repeat Step 4 & 5 until all the columns are filled.

Step 7: Write answer using #'s below line as coefficients. Start variables one exponent less than what you are dividing.

EX 2: $(2v^3 - 20v^2 + 56v - 46) \div (v - 6)$

$$v - 6 = 0$$

$$\begin{array}{r} +6 \\ +6 \\ \hline \end{array}$$

$$v = 6$$

$$\begin{array}{r} \boxed{6} \quad | \quad 2 \downarrow \quad -20 \downarrow + \quad 56 \downarrow + \quad -46 \downarrow + \\ \hline 2 \quad -8 \quad 8 \quad \boxed{2} \rightarrow \text{remainder} \\ \hline 2v^2 - 8v + 8 + \frac{2}{v-6} \end{array}$$

$$2v^2 - 8v + 8 + \frac{2}{v-6}$$

EX 3: $(5b^4 + 8b^3 - 3b^2 + 2b + 7) \div (b + 4)$

$$b + 4 = 0$$

$$\begin{array}{r} -4 \\ -4 \\ \hline \end{array}$$

$$b = -4$$

$$\begin{array}{r} \boxed{-4} \quad | \quad 5 \downarrow \quad 8 \downarrow \quad -3 \downarrow \quad 2 \downarrow \quad 7 \\ \hline 5 \quad -12 \quad 45 \quad -178 \quad \boxed{719} \rightarrow \text{remainder} \\ \hline 5b^3 - 12b^2 + 45b - 178 + \frac{719}{b+4} \end{array}$$

$$5b^3 - 12b^2 + 45b - 178$$

$$+ 719$$

$$b + 4$$