

2.3: Synthetic Division

Ex 1) $\frac{(x^3 + 2x^2 - 1x - 2)}{\text{dividing}} \div \frac{(x-1)}{\text{dividing by}}$

Step 1: set what you are dividing by equal to zero & solve.

$$x-1=0$$

$$+1 \quad +1$$

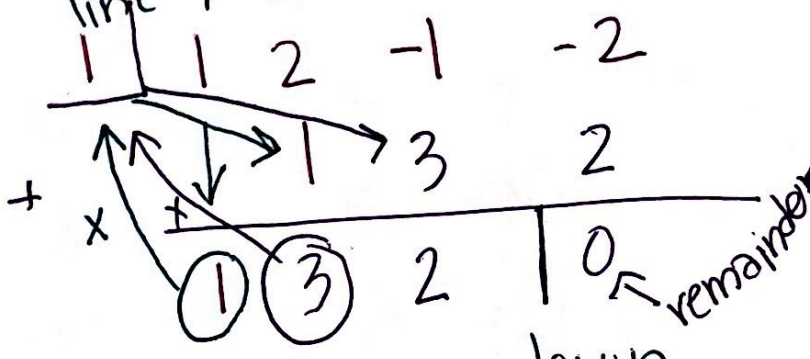
$$x=1$$

Step 2: Put that # in a box

Step 7: Write answer using #'s below line as coefficients & start one exponent less than what you were dividing

$x^2 + 3x + 2$

Step 3: line up coefficients from what you are dividing next line to the box. Skip a draw a horizontal line



Step 4: Bring down first number

Step 5: multiply # below the line w/ the # in the box. Put answer in the next column above the line

Step 6: add column & repeat until all columns are filled

$$\circ \text{Ex 2) } (2v^3 - 20v^2 + 56v - 46) \div (v-6)$$

$$v-6=0$$

$$+6 \quad +6$$

$$v=6$$

$$\begin{array}{r|rrrr} 6 & 2 & -20 & 56 & -46 \\ & \downarrow & 12 & -48 & 48 \\ \hline & 2 & -8 & 8 & 2 \leftarrow R \end{array}$$

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

$$\circ \text{Ex 3) } (5b^4 + 8b^3 - 3b^2 + 2b + 7) \div (b+4)$$

$$b+4=0$$

$$-4 \quad -4$$

$$b=-4$$

$$\begin{array}{r|rrrrr} -4 & 5 & 8 & -3 & 2 & 7 \\ & \downarrow & -20 & 48 & -180 & 712 \\ \hline & 5 & -12 & 45 & -178 & 719 \end{array}$$

$$\boxed{5b^3 - 12b^2 + 45b - 178 + \frac{719}{b+4}}$$