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$x^3 + 5x^2 + 4$ divided by $x + 5$

$x+5=0$
 $x=-5$

$$\begin{array}{r|rrrr} -5 & 1 & 5 & 0 & 4 \\ & \downarrow & -5 & 0 & 0 \\ \hline & 1 & 0 & 0 & 4 \end{array}$$

new coefficients $\rightarrow$

$$1x^2 + 0x + 0$$
$$\boxed{x^2 + \frac{4}{x+5}}$$

$x^4 - 6x^3 - 8x^2 + 7x + 3$ divided by $x - 7$

$x-7=0$
 $x=7$

$$\begin{array}{r|rrrrr} 7 & 1 & -6 & -8 & 7 & 3 \\ & \downarrow & 7 & 7 & 7 & 0 \\ \hline & 1 & 1 & -1 & 0 & 3 \end{array}$$

new coefficients:

$$1x^3 + 1x^2 - 1x + 0$$
$$\boxed{x^3 + x^2 - x + \frac{3}{x-7}}$$

$-1x^3 - 5x^2 + 7$ divided by $x + 5$

$x+5=0$
 $x=-5$

$$\begin{array}{r|rrrr} -5 & -1 & -5 & 0 & 7 \\ & \downarrow & 5 & 5 & 0 \\ \hline & -1 & 0 & 0 & 7 \end{array}$$

new coefficients:

$$-1x^2 + 0x + 0$$
$$\boxed{-x^2 + \frac{7}{x+5}}$$

$-x^4 + 8x^3 - 17x^2 + 16$ divided by $x - 4$

$$\begin{array}{r|rrrrr} 4 & -1 & 8 & -17 & 0 & 16 \\ & \downarrow & 4 & -4 & 16 & -4 \\ \hline & -1 & 4 & -1 & -4 & 0 \end{array}$$

new coefficients:

$$-1x^3 + 4x^2 - 1x - 4$$
$$\boxed{-x^3 + 4x^2 - x - 4 + \frac{0}{x-4}}$$

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