

M3 U2 D1 Synthetic Division WS
6.4 Synthetic Division WS

ANSWER KEY

① $(x^2 + 5x + 1) \div (x + 3)$ $\underline{-3} \mid 1 \ 5 \ 1$

$$\begin{array}{r} \\ \downarrow -3 \ -6 \\ 1 \ 2 \ \underline{-5} \end{array}$$

not a factor b/c it has a remainder

$x + 2 \ R: -5$
 $x + 2 - \frac{5}{x+3}$

② $(2x^3 - 11x^2 + 9x - 20) \div (x - 5)$ $\underline{5} \mid 2 \ -11 \ 9 \ -20$

$$\begin{array}{r} \\ \downarrow 10 \ -5 \ 20 \\ 2 \ -1 \ 4 \ \underline{0} \end{array}$$

$2x^2 - x + 4$

③ $(2x^3 + 4x^2 - 3x - 6) \div (x + 3)$ $\underline{-3} \mid 2 \ 4 \ -3 \ -6$

$$\begin{array}{r} \\ \downarrow -6 \ 6 \ -9 \\ 2 \ -2 \ 3 \ \underline{-15} \end{array}$$

$2x^2 - 2x + 3 - \frac{15}{x+3}$
 $2x^2 - 2x + 3 \ R: -15$

④ $(2x^3 - 11x^2 + 13x - 44) \div (x - 5)$ $\underline{5} \mid 2 \ -11 \ 13 \ -44$

$$\begin{array}{r} \\ \downarrow 10 \ -5 \ 40 \\ 2 \ -1 \ 8 \ \underline{-4} \end{array}$$

$2x^2 - x + 8 \ R: -4$
 $2x^2 - x + 8 - \frac{4}{x-5}$

⑤ $(2x^2 + 3x - 4) \div (x - 2)$ $\underline{2} \mid 2 \ 3 \ -4$

$$\begin{array}{r} \\ \downarrow 4 \ 14 \\ 2 \ 7 \ \underline{10} \end{array}$$

$2x + 7 \ R: 10$
 $2x + 7 + \frac{10}{x-2}$

⑥ $(n^4 + 5n^3 - 6n + 3) \div (n + 3)$ $\underline{-3} \mid 1 \ 5 \ 0 \ -6 \ 3$

$$\begin{array}{r} \\ \downarrow -3 \ -6 \ 18 \ -36 \\ 1 \ 2 \ -6 \ 12 \ \underline{-33} \end{array}$$

$n^3 + 2n^2 - 6n + 12 \ R: -33$
 $n^3 + 2n^2 - 6n + 12 - \frac{33}{n+3}$

$$\textcircled{7} (x^3 - 125) \div (x - 5) \quad \underline{5} \mid 1 \ 0 \ 0 \ -125$$

$$\quad \quad \quad \downarrow \ 5 \ 25 \ 125$$

$$\quad \quad \quad \hline \quad \quad \quad 1 \ 5 \ 25 \ \underline{0}$$

$$\textcircled{x^2 + 5x + 25}$$

$$\textcircled{8} (5x^4 + 2x^2 - 15x + 10) \div (x + 2) \quad \underline{-2} \mid 5 \ 0 \ 2 \ -15 \ 10$$

$$\quad \quad \quad \downarrow \ -10 \ 20 \ -44 \ 118$$

$$\quad \quad \quad \hline \quad \quad \quad 5 \ -10 \ 22 \ -59 \ \underline{128}$$

$$\boxed{5x^3 - 10x^2 + 22x - 59 \quad R: 128}$$

$$\textcircled{5x^3 - 10x^2 + 22x - 59 + \frac{128}{x+2}}$$