

3.2 Synthetic Division

$$\begin{array}{r}
 3x^2 + 10x + 40 \\
 \hline
 x-4 \overline{) 3x^3 - 2x^2 + 0x - 150} \\
 \underline{- 3x^3 + 12x^2} \\
 10x^2 + 0x \\
 \underline{- 10x^2 + 40x} \\
 40x - 150 \\
 \underline{- 40x + 160} \\
 10
 \end{array}$$

$$\frac{3x^3 - 2x^2 - 150}{x-4} = 3x^2 + 10x + 40 + \frac{10}{x-4} \text{ Remainder}$$

4	3	-2	0	-150
	↓	→ 12	→ 40	160
	3	10	40	10

$$3x^2 + 10x + 40 + \frac{10}{x-4} \text{ Remainder}$$

(w 15, 27

3.2 # 15

$$\frac{-9x^3 + 8x^2 - 7x + 2}{x-2} = \boxed{-9x^2 - 10x - 27 \quad \frac{-52}{x-2}}$$

$$\begin{array}{r} 2 \quad | \quad -9 \quad 8 \quad -7 \quad 2 \\ \quad \quad | \quad -18 \quad -20 \quad -54 \\ \hline \quad \quad | \quad -9 \quad -10 \quad -27 \quad -52 \end{array}$$

#27 $f(x) = x^3 + 4x^2 + 5x + 2; k = -2$

$$\begin{array}{r} -2 \quad | \quad 1 \quad 4 \quad 5 \quad 2 \\ \quad \quad | \quad -2 \quad -4 \quad -2 \\ \hline \quad \quad | \quad 1 \quad 2 \quad 1 \quad 0 \end{array}$$

$$\boxed{f(x) = \underbrace{(x+2)}_{x+2} \underbrace{(x^2+2x+1)}_{x+2} + 0}$$

$$\frac{x^3 + 4x^2 + 5x + 2}{x+2} = x^2 + 2x + 1 + \frac{0}{x+2}$$