

2.3a p.124  
 (9-31 odd, 45, 49)

$$\begin{array}{r} x+2 \\ x+3 \overline{) x^2+5x+6} \\ \underline{-x^2+3x} \phantom{+6} \\ 2x+6 \\ \underline{-2x+6} \\ 0 \end{array}$$

$(x+2)(x+3)$

$$\begin{array}{r} x^2+3x-18 \\ x+2 \overline{) x^3+5x^2-12x-36} \\ \underline{-x^3+2x^2} \phantom{-12x-36} \\ 3x^2-12x \phantom{-36} \\ \underline{-3x^2+6x} \phantom{-36} \\ -18x-36 \\ \underline{+18x+36} \\ 0 \end{array}$$

$(x^2+3x-18)(x+2)$

$$\begin{array}{r} x^2-x-20 \\ x-3 \overline{) x^3-4x^2-17x+6} \\ \underline{-x^3+3x^2} \phantom{-17x+6} \\ -x^2-17x \phantom{+6} \\ \underline{+x^2+3x} \phantom{+6} \\ -20x+6 \\ \underline{-20x+60} \\ -54 \end{array}$$

$x^2-x-20 - \frac{54}{x-3}$

$$\begin{array}{r} 7x^2-14x+28 \\ x+2 \overline{) 7x^3+0x^2+0x+3} \\ \underline{-7x^3+14x^2} \phantom{+0x+3} \\ -14x^2+0x \phantom{+3} \\ \underline{+14x^2+28x} \phantom{+3} \\ 28x+3 \\ \underline{-28x+56} \\ -53 \end{array}$$

$7x^2-14x+28 - \frac{53}{x+2}$

$$\begin{array}{r} 5x-1 \\ 2x^2+0x+1 \overline{) 10x^3-2x^2+5x-1} \\ \underline{-10x^3+0x^2+5x} \phantom{-1} \\ -2x^2+0x-1 \\ \underline{+2x^2-0x+1} \\ 0 \end{array}$$

$(5x-1)$

$$\begin{array}{r} x \\ x^2+0x+1 \overline{) x^3+0x^2+0x-9} \\ \underline{-x^3+0x^2+x} \phantom{-9} \\ -x-9 \end{array}$$

$x - \frac{x-9}{x^2+1}$  or

$x - \frac{(x+9)}{x^2+1}$

$$(21) \quad \frac{2x^3 - 4x^2 - 15x + 5}{(x-1)^2}$$

$$\begin{array}{r} x^2 - 2x + 1 \\ \hline 2x^3 - 4x^2 - 15x + 5 \\ - 2x^3 + 4x^2 - 2x \\ \hline -17x + 5 \end{array}$$

$$2x - \frac{17x - 5}{x^2 - 2x + 1}$$

$$(23) \quad (3x^3 - 17x^2 + 15x - 25) \div (x - 5)$$

$$\begin{array}{r} 5 \overline{) 3 \quad -17 \quad 15 \quad -25} \\ \underline{15 \quad -10 \quad 25} \\ 3 \quad -2 \quad 5 \quad 0 \\ \downarrow \quad \downarrow \quad \downarrow \\ 3x^2 - 2x + 5, \quad x \neq 5 \end{array}$$

$$(25) \quad (6x^3 + 7x^2 - x + 26) \div (x - 3)$$

$$\begin{array}{r} 3 \overline{) 6 \quad 7 \quad -1 \quad 26} \\ \underline{18 \quad 75 \quad 222} \\ 6 \quad 25 \quad 74 \quad 248 \\ \hline 6x^2 + 25 + 74 + \frac{248}{x-3} \end{array}$$

$$(27) \quad (9x^3 - 18x^2 - 16x + 32) \div (x - 2)$$

$$\begin{array}{r} 2 \overline{) 9 \quad -18 \quad -16 \quad 32} \\ \underline{18 \quad 0 \quad -32} \\ 9 \quad 0 \quad -16 \quad 0 \end{array}$$

$$9x^2 - 16, \quad x \neq 2$$

$$(29) \quad (x^3 + 512) \div (x + 8)$$

$$\begin{array}{r} -8 \overline{) 1 \quad 0 \quad 0 \quad 512} \\ \underline{-8 \quad 64 \quad -512} \\ 1 \quad -8 \quad 64 \quad 0 \\ \hline x^2 - 8x + 64, \quad x \neq -8 \end{array}$$

$$(31) \quad \frac{4x^3 + 16x^2 - 23x - 15}{x + \frac{1}{2}}$$

$$\begin{array}{r} -\frac{1}{2} \overline{) 4 \quad 16 \quad -23 \quad -15} \\ \underline{-2 \quad -7 \quad 15} \\ 4 \quad 14 \quad -30 \quad 0 \\ \hline 4x^2 + 14x - 30, \quad x \neq -\frac{1}{2} \end{array}$$

$$(45) \quad h(x) = x^3 - 5x^2 - 7x + 4$$

$$(a) \quad h(3)$$

$$\begin{array}{r} 3 \overline{) 1 \quad -5 \quad -7 \quad 4} \\ \underline{-3 \quad -6 \quad -39} \\ 1 \quad -2 \quad -13 \quad -35 \end{array}$$

$$(b) \quad h(2)$$

$$\begin{array}{r} 2 \overline{) 1 \quad -5 \quad -7 \quad 4} \\ \underline{2 \quad -6 \quad -26} \\ 1 \quad -3 \quad -13 \quad -22 \end{array}$$

$$(c) \quad h(-2)$$

$$\begin{array}{r} -2 \overline{) 1 \quad -5 \quad -7 \quad 4} \\ \underline{-2 \quad 14 \quad -14} \\ 1 \quad -7 \quad 7 \quad -10 \end{array}$$

$$(d) \quad h(-5)$$

$$\begin{array}{r} -5 \overline{) 1 \quad -5 \quad -7 \quad 4} \\ \underline{-5 \quad 50 \quad -215} \\ 1 \quad -10 \quad 43 \quad -211 \end{array}$$

Poly

Value of x

(49)  $2x^3 - 17x^2 + 12x + 63 = 0$

$x = -\frac{3}{2}$

$$\begin{array}{r|rrrr} -\frac{3}{2} & 2 & -17 & 12 & 63 \\ & & -3 & 30 & -63 \\ \hline & 2 & -20 & 42 & 0 \end{array}$$

$2x^2 - 20x + 42$

$2(x^2 - 10x + 21)$

$2(x-7)(x-3)$

$(x + \frac{3}{2})$

$(2x+3)(x-7)(x-3)$

$2(x-7)(x-3)(2x+3)$

Zeros  $-\frac{3}{2}, +7, +3$