

2.3

$$\begin{array}{r} 991\frac{1}{3} \\ 3 \overline{) 2974} \\ \underline{-27} \\ 27 \\ \underline{-27} \\ 04 \\ \underline{-3} \\ 1 \end{array}$$

$$\frac{5x^2 - 17x - 12}{x - 4}$$

$$x - 4$$

$$5x + 3$$

$$x-4 \overline{) 5x^2 - 17x - 12}$$

$$-(5x^2 - 20x)$$

$$\hline 3x - 12$$

$$-(3x - 12)$$

$$\hline 0$$

0

$$(x-4)(5x+3)$$

$$5x^2 - 17x - 12$$

$$\frac{5x^2}{x}$$

$$5x$$

$$25. \quad \frac{5x^3 - 6x^2 + 8}{x-4}$$

$$\begin{array}{r}
 5x^2 + 14x + 56 + \frac{232}{x-4} \\
 x-4 \overline{) 5x^3 - 6x^2 + 0x + 8} \\
 \underline{- 5x^3 - 20x^2} \\
 14x^2 + 0x \\
 \underline{- 14x^2 - 56x} \\
 56x + 8 \\
 \underline{- 56x - 224} \\
 232
 \end{array}$$

Synthetic Division

$$\underline{x^5 - 13x^4 - 120x + 80}$$

$$x + 3$$

$$\begin{aligned} x + 3 &= 0 \\ x &= -3 \end{aligned}$$

$$\begin{array}{r|rrrrrr} -3 & 1 & -13 & 0 & 0 & -120 & 80 \\ & \downarrow & -3 & \text{Add } 48 & -144 & 432 & -936 \\ \hline & 1 & -16 & 48 & -144 & 312 & -856 \end{array}$$

$$\begin{array}{r} 48 \\ 3 \\ \hline 144 \\ 3 \\ \hline 432 \end{array}$$

$$\begin{array}{cccccc} x^4 & x^3 & x^2 & x & \text{Constant} & \text{Remainder} \end{array}$$

$$x^4 - 16x^3 + 48x^2 - 144x + 312 + \frac{-856}{x+3}$$

$$\underline{x^4 + 5x^3 + 6x^2 - x - 2}$$

$$\begin{aligned} x+2 &= 0 \\ x &= -2 \end{aligned}$$

$$x+2$$

-2	1	5	6	-1	-2
	↓	-2	-6	0	2
	1	3	0	-1	0
	x^3	x^2	x	C	R

$$x^3 + 3x^2 - 1$$

$$45. f(x) = 2x^5 - 3x^2 - 4x - 1$$

$$f(-2) = 2(-2)^5 - 3(-2)^2 - 4(-2) - 1$$

$$f(-2) = -64 - 12 + 8 - 1$$

$$f(-2) = -69$$

$$\begin{array}{r|rrrrrr}
 -2 & 2 & 0 & 0 & -3 & -4 & -1 \\
 & & -4 & 8 & -16 & +38 & -68 \\
 \hline
 & 2 & -4 & 8 & -19 & 34 & -69
 \end{array}$$

$$53 \quad f(x) = 2x^3 + 3x^2 - 17x + 12$$

$$(2x-3)(x-1)$$

$$2x-3=0 \\ x=\frac{3}{2}$$

$$\begin{array}{r|rrrr} 1 & 2 & 3 & -17 & 12 \\ & & 2 & 5 & -12 \\ \hline \frac{3}{2} & 2 & 5 & -12 & 0 \\ & & 3 & 12 & \\ \hline & 2 & 8 & 0 & \\ & x & c & R & \end{array}$$

$$\frac{12}{2}$$

$$\frac{6}{2}$$

$$8 \cdot \frac{3}{2}$$

$$(2x+8)(2x-3)(x-1)$$

$$2(x+4)(2x-3)(x-1)=0$$

$$2 \neq 0 \quad x+4=0 \quad 2x-3=0 \quad x-1=0$$

$$x=-4 \quad x=\frac{3}{2} \quad x=1$$