A34 4.3 pg 177–178 / 1, 3, 8, 11, 14, 17, 23, 27, 28, 33, 38, 39, 40

1.

3. $(x^3 - 2x^2 - 9x + 18) \div (x+3)$

$= x^2 - 5x + 6$

8. $x^2 + 0x + 1 \;\overline{)\; 7x^3 + x^2 + x + 0}$

$7x + 1 + \frac{-6x-1}{x^2+1}$

$-(7x^3 + 0x^2 + 7x)$

$x^2 - 6x + 0$

$-(x^2 + 0x + 1)$

$-6x - 1$

11. $4 \mid 1 \quad 8 \quad 1$

$\quad\quad 4 \quad 48$

$1 \quad 12 \quad 49$

(11) $x + 12 + \frac{49}{x-4}$

14. $-3 \mid 1 \quad 0 \quad -4 \quad 6$

$\quad\quad -3 \quad 9 \quad -15$

$1 \quad -3 \quad 5 \quad -9$

(14) $x^2 - 3x + 5 - \frac{9}{x+3}$

17. $6 \mid 1 \quad -5 \quad -8 \quad +13 \quad -12$

$\quad\quad 6 \quad 6 \quad -12 \quad 6$

$1 \quad 1 \quad -2 \quad 1 \quad -6$

(17) $x^3 + x^2 - 2x + 1 - \frac{6}{x-6}$

(23) The quotient should be 1 degree less than the dividend. $x^2 + 2x - 1 + \frac{1}{x-2}$

27. $f(x) = x^3 - 2x^2 + 4x + 3$

$f(2) = (2)^3 - 2(2)^2 + 4(2) + 3$

$= 11$

$2 \mid 1 \quad -2 \quad +4 \quad +3$

$\quad\quad 2 \quad 0 \quad 8$

$1 \quad 0 \quad 4 \mid 11$

28. $f(x) = x^3 + x^2 - 3x + 9$

$f(-4) = (-4)^3 + (-4)^2 - 3(-4) + 9$

$= -64 + 16 + 12 + 9$

$= -27$

$-4 \mid 1 \quad 1 \quad -3 \quad 9$

$\quad\quad -4 \quad 12 \quad -36$

$1 \quad -3 \quad 9 \mid -27$

(33) No, the Remainder Thm states $f(a) = 15$

38. Remainder Thm

$\frac{f(x)}{x-k}$ then $r = f(k)$

$-15 = f(k)$

from graph ↗ happens when

(38a) $k = -4$

(38b) $f(-3) = f(-1) = 0$

39. $V = 2x^3 + 17x^2 + 46x + 40$

$x+2 \quad -2 \mid 2 \quad 17 \quad 46 \quad 40$

$\quad\quad -4 \quad -26 \quad -40$

$2 \quad 13 \quad 20 \mid 0$

$2x^2 + 13x + 20$

$x+4 \quad -4 \mid 2 \quad 13 \quad 20$

$\quad\quad -8 \quad -20$

$2 \quad 5 \mid 0$

(39) $2x + 5$

40. $x+2 \;\overline{)\; ?}$ $\quad 5x^2 - 13x + 47 - \frac{102}{x+2}$

$\frac{x+2}{1} \;\overline{)\; \frac{?}{x+2}} = 5x^2 - 13x + 47 - \frac{102}{x+2}$

$5x^3 - 13x^2 + 47x + 10x^2 - 26x + 94 - 10$

(40) $5x^3 - 3x^2 + 21x - 8$