38a) $f(x) = kx + d$

I $f(-2) = 5$ ⟹ I $-2k + d = 5$

II $f(3) = -20$ ⟹ II $3k + d = -20$ ⟹ $f(x) = -5x - 5$

$k = -5 \; ; d = -5$

38b) $f(x) = ax^2 + bx + c$

① $A = (-5|-44)$: I $25a - 5b + c = -44$

② $B = (1|4)$: II $a + b + c = 4$

③ $C = (5|-84)$: III $25a + 5b + c = -84$

⟹ CAS: $a = -3, \; b = -4, \; c = 11$

$f(x) = -3x^2 - 4x + 11$

38c) $f(x) = ax^3 + bx^2 + cx + d$

I $-a + b - c + d = 9$

II $d = 2$

III $27a + 9b + 3c + d = 41$

IV $216a + 36b + 6c + d = 296$

$a = 1, \; b = 3, \; c = -5, \; d = 2$

$f(x) = x^3 + 3x^2 - 5x + 2$

38d) $f(x) = ax^4 + bx^3 + cx^2 + dx + e$

I $a + b + c + d + e = -3$

II $625a - 125b + 25c - 5d + e = 141$

III $81a + 27b + 9c + 3d + e = 109$

IV $4096a - 512b + 64c - 8d + e = 2265$

V $e = 1$

$a = 1, \; b = 3, \; c = -5, \; d = -3, \; e = 1$

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

39a) $f(x) = ax^3 + bx^2 + cx + d$

$f'(x) = 3ax^2 + 2bx + c$

$f''(x) = 6ax + 2b$

① $S = (2|-3)$

I $f(2) = -3$: $8a + 4b + 2c + d = -3$

II $f'(2) = 0$: $12a + 4b + c = 0$

III $f''(2) = 0$: $12a + 2b = 0$

$a = 0,5 \qquad c = 6$
$b = -3 \qquad d = -7$

$f(x) = 0,5x^3 - 3x^2 + 6x - 7$

② $P = (4|1)$ IV : $64a + 16b + 4c + d = 1$

$f(4) = 1$

39b) $f(x) = ax^2 + bx + c$

$f'(x) = 2ax + b$

① $f'(1) = 0$ — I : $2a + b = 0$

② $f'(-4) = -20$ — II : $-8a + b = -20$

③ $f(3) = 0$ — III : $9a + 3b + c = 0$

$a = 2, b = -4, c = -6$

$f(x) = 2x^2 - 4x - 6$

39c) $f(x) = ax^4 + bx^3 + cx^2 + dx + e$

$f'(x) = 4ax^3 + 3bx^2 + 2cx + d$

$f''(x) = 12ax^2 + 6bx + 2c$

① $W_1 = (-1|-4)$

$\rightarrow f(-1) = -4$ — I : $a - b + c - d + e = -4$

$\rightarrow f''(-1) = 0$ — II : $12a - 6b + 2c = 0$

$a = 1, b = 0, c = -6, d = 0, e = 1$

$f(x) = x^4 - 6x^2 + 1$

② $W_2 = (1|-4)$

$\rightarrow f(1) = -4$ — III : $a + b + c + d + e = -4$

$\rightarrow f''(1) = 0$ — IV : $12a + 6b + 2c = 0$

② $y = 8x = 4 \Rightarrow f'(-1) = 8$ | V : $-4a + 3b - 2c + d = 8$

$y = 8x + 4$

39d, $f(x) = ax^3 + bx^2 + cx + d$

$f'(x) = 3ax^2 + 2bx + c$ ✗

$f''(x) = 6ax + 2b$

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① $H = (1 | -14)$

　　○ $f(1) = -14$: I $a + b + c + d = -14$

　　○ $f'(1) = 0$ II $3a + 2b + c = 0$

② $P = (2 | -17,5)$

　　○ $f(2) = -17,5$ III $8a + 4b + 2c + d = -17,5$

③ $f'(3) = -10$ IV $27a + 6b + c = -10$

$a = 0,5 \quad b = -5,5$
$c = 9,5 \quad d = -18,5$

$f(x) = 0,5x^3 - 5,5x^2 + 9,5x - 18,5$

39e, $f(x) = ax^2 + bx + c$

　　$f'(x) = 2ax + b$

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① $f(-1) = -5$; I $a - b + c = -5$

② $f(4) = -20$ II $16a + 4b + c = -20$

③ $x = 3:$ $y + 6x = 5$. III $6a + b = -6$

　　$y = -6x + 5$

　　$f'(3) = -6$

$a = -1, b = 0, c = -4$

$f(x) = -x^2 - 4$

39f, ✗

① $f'(5) = 0$ I $75a + 10b + c = 0$

　$f''(5) = 0$ II $30a + 2b = 0$

② $f'(-4) = 3$ III $48a - 8b + c = 3$

③ $f(-6) = -1$ IV $-216a + 36b - 6c + d = -1$

$a \approx 0,01 \quad b \approx -0,19$
$c \approx 0,93 \quad d \approx 13,89$

$f(x) = 0,01x^3 - 0,19x^2 + 0,93x + 13,89$

35a) $f(x) = ax^4 + bx^3 + cx^2 + dx + e$

$f'(x) = 4ax^3 + 3bx^2 + 2cx + d$

$\underline{f''(x) = 12ax^2 + 6bx + 2c}$

① $H_1 = (-1|1)$

• $f(-1) = 1$

• $f'(-1) = 0$

I $a - b + c - d + e = 1$

II $-4a + 3b - 2c + d = 0$

$a = -1, c = 2$

$b, d, e = 0$

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

② $H_2 = (1|1)$

• $f(1) = 1$

• $f'(1) = 0$

III $a + b + c + d + e = 1$

IV $4a + 3b + 2c + d = 0$

③ $f(0) = 0$

V $e = 0$

40a) $f(x) = ax^3 + bx^2 + cx + d$

$\underline{f'(x) = 3ax^2 + 2bx + c}$

① $H = (0|3)$

• $f(0) = 3$

• $f'(0) = 0$

I $d = 3$

II $c = 0$

$a = 1, b = -3, c = 0, d = 3$

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

② $P - (1|1)$

• $f(1) - 1$

III $a + b + c + d = 1$

③ $P = (2|-1)$

IV $8a + 4b + 2c + d = -1$

40b) $f(x) = ax^4 + bx^3 + cx^2 + dx + e$ $f'(x) = 4ax^3 + 3bx^2 + 2cx + d$

① $T = (-2|-5)$

• $f(-2) = -5$

• $f'(-2) = 0$

I $16a - 8b + 4c - 2d + e = -5$

II $-32a + 12b - 4c + d = 0$

$a = 0,5; c = -4; e = 3$

② $T = (2|-5)$

• $f(2) = -5$

• $f'(2) = 0$

III $16a + 8b + 4c + 2d + e = -5$

IV $32a + 12b + 4c + d = 0$

$f(x) = 0,5x^4 - 4x^2 + 3$

③ $P = (0|3)$

• $f(0) = 3$ V $e = 3$