Quiz #2 (Answers)

① As $x \to -\infty$, $f(x) \to \infty$
As $x \to \infty$, $f(x) \to -\infty$

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③ As $x \to -\infty$, $f(x) \to -\infty$
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④ As $x \to -\infty$, $f(x) \to -\infty$
As $x \to \infty$, $f(x) \to -\infty$

⑤

-2	2	-4	-3	1
	$\downarrow$	-4	16	-26
	2	-8	13	-25

: $2x^2 - 8x + 13 - \frac{25}{x+2}$

⑥

1	4	-3	0	2	4	-2
	$\downarrow$	4	1	1	3	7
	4	1	1	3	7	5

: $4x^4 + x^3 + x^2 + 3x + 7 + \frac{5}{x-1}$

⑦ $x+3 \overline{)4x^3-2x^2-4x+1}$

$4x^2-14x+38-\frac{113}{x+3}$

$(-)\ 4x^3+12x^2$ ↓

$-14x^2-4x$

$(-)\ -14x^2-42x$ ↓

$38x+1$

$(-)\ 38x+114$

-113

⑧ $x+2 \overline{)5x^4-2x^3+2x^2-5x-2}$

$5x^3-12x^2+26x-57+\frac{112}{x+2}$

$(-)\ 5x^4+10x^3$ ↓

$-12x^3+2x^2$

$(-)\ -12x^3-24x^2$ ↓

$26x^2-5x$

$(-)\ 26x^2+52x$ ↓

$-57x-2$

$(-)\ -57x-114$

112

⑨ $f(x) = 4x^3-8x^2-2x+3$

(+) Reals : 2 or 0

$f(-x) = -4x^3-8x^2+2x+3$

(-) Reals : 1

⑩ $g(x) = -2x^4-3x^3+2x^2+4x+3$

(+) Reals : 1

$g(-x) = -2x^4+3x^3+2x^2-4x+3$

(-) Reals : 3 or 1

(15) $x^3 + 3x^2 - x - 3 = 0$

-3	1	3	-1	-3
	↓	-3	0	3
	1	0	-1	0

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

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

Zeros / Solutions

$x = -3, \; x = -1, \; x = 1$

(16) $2x^3 + 11x^2 + 10x - 3 = 0$

-3/2	2	11	10	-3
	↓	-3	-12	3.
	2	8	-2	0

$(2x+3)(2x^2+8x-2) = 0$

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

$\boxed{x = -3/2}$

$$x = \frac{-4 \pm \sqrt{4^2 - 4(1)(-1)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16+4}}{2}$$

$$x = \frac{-4 \pm \sqrt{20}}{2} = \frac{-4 \pm \sqrt{4 \cdot 5}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{5}}{2} = \boxed{-2 \pm \sqrt{5}}$$