1. $f(x) = \begin{cases} a/x + 1, & x \leq 2 \\ x^2 - x + 1, & x > 2 \end{cases}$

$$f(x) = \lim_{x \to 2^-} f(x) = \lim_{x \to 2^+} f(x)$$

$$f(x) = \lim_{x \to 2^-} a/x + 1 = \lim_{x \to 2^+} x^2 - x + 1$$

$$a/2 + 1 = (2)^2 - 2 + 1$$

$$a/2 + 1 = 3$$

$$a/2 = 3 - 1$$

$$a/2 = 2$$

$$a = 4$$

$$f'_-(2) = f'_+(2)$$

$$\lim_{x \to 2^-} \frac{f(x) - f(2)}{x - 2} = \lim_{x \to 2^+} \frac{f(x) - f(2)}{x-2}$$

$$\lim_{x \to 2^-} \frac{a/x + 1 - (a/2 + 1)}{x - 2} = \lim_{x \to 2^+} \frac{x^2 - x + 1 - (a/2 + 1)}{x - 2}$$

$$\lim_{x \to 2} \frac{-a(x-2)}{2x(x-2)} = \lim_{x \to 2^+} \frac{x^2 - x + 1 - (3)}{x - 2}$$

$$\lim_{x \to 2} \frac{-a}{2x} = \lim_{x \to 2^+} \frac{x^2 - x - 2}{x - 2}$$

$$-\frac{a}{4} = \lim_{x \to 2^+} \frac{(x-2)(x+1)}{x-2}$$

$$-\frac{a}{4} = \lim_{x \to 2^+} (x+1) = -\frac{a}{4} = 3 \qquad -\frac{4}{4} = 3 \qquad -1 = 3$$

2. $f(x) = 2x^3 - 9x^2 + 12x$

$f'(x) = 6x^2 - 18x + 12$

$f'(x) = 6(x-1)(x-2)$

$x = 1, \; x = 2$

+++   ---   +++

1   2

$f(x)$ $(-\infty, 1)$ dan $(2, \infty)$

$f(x)$ $(1, 2)$

$f'(x) = 6(x-1)(x-2) = 0$

$x = 1, \; x = 2$

$f''(x) = 12x - 18 = 6(2x-3)$

$f''(1) = 12(1) - 18 = -6 < 0$, titik $(1, -6)$ adalah titik ekstrim maksimum

$f''(2) = 12(2) - \cancel{18}\, 18 = 6 > 0$, titik $(2, 0)$

$f'(x) = 6x^2 - 18x + 12$

$f''(x) = 12x - 18$

$f''(x) = 12x - 18 = 6(2x-3)$

$x = 3/2$

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$f'(x) = 6x^2 - 18x + 12$

$f''(x) = 12x - 18$

$x = 3/2$

$f(3/2) = 2(3/2)^3 - 9(3/2) + 12(3/2)$

$f(3/2) = 9/2$

$\left(\frac{3}{2}, \frac{9}{2}\right)$