

Subject:

Year. Month. Date. ()

$$f(x) = \left(\frac{1}{x}\right)^{n-1} - 1$$

$$y = \sqrt{x^c f(x+1)}$$

$$x^r \rightarrow n \rightarrow$$

$$x^c f(x+1) \geq 0 \rightarrow x^c x \left(\left(\frac{1}{x}\right)^{n-1} - 1\right) \geq 0$$

$$\left(\frac{1}{x}\right)^{n-1} - 1 \geq 0 \rightarrow n \leq 1 \quad - \frac{0}{0} + \frac{0}{0} - \rightarrow Df = \begin{bmatrix} 0 & 1 \end{bmatrix}$$

$$f(x) = \sqrt{x + |x+2|}$$

$$f(-x) = \sqrt{-x + |-x+2|}$$

$$1) x < 2 \rightarrow -x - x + 2 = -2x + 2 \rightarrow |x|$$

$$Df = (-\infty, -1] \quad 2) x > 2 \rightarrow -x - (-x+2) = -2 \rightarrow \text{و.ع.ع}$$

$$y = \sqrt{\frac{x-1}{f(x)}}$$

$$1) f(x) \neq 0 \rightarrow x \neq 1, 2, -2$$

$$2) \frac{x-1}{f(x)} \geq 0 \rightarrow \frac{-2}{-1} + \frac{1}{0} + \frac{2}{1} - \rightarrow Df = (-2, 1] \cup (2, \infty)$$

$$Dy_1 \cap Dy_2$$

$$\sqrt{-(a+b)} \geq 0 \rightarrow \sqrt{-(-2)} = (2)$$

$$y_1 = \frac{1}{4x^2 - 4x^2 - 2x - 2} \rightarrow \frac{4x^2 - 4x^2 - 2x - 2}{(4x^2 - 4x^2 + 1) - 2x - 2} = \frac{-2x - 2}{1 - 2x - 2} = \frac{-2x - 2}{-2x - 1}$$

$$y_2 = \frac{1}{x^2 + ax + b} \quad (4x^2 - 1)^2 - (x+2)^2 \neq 0 \rightarrow 4x^2 - 1 = x+2$$

$$4x^2 - 1 = x+2 \rightarrow 4x^2 - x - 3 = 0 \rightarrow x = \frac{1 \pm \sqrt{1+48}}{8} = \frac{1 \pm 7}{8} \rightarrow x = 1, -\frac{3}{4}$$

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

$$y = \sqrt{f(x) - f\left(\frac{x}{2}\right)} \rightarrow f(x) - f\left(\frac{x}{2}\right) = x^2 + x - \left(\frac{x^2}{4} + \frac{x}{2}\right) = \frac{3x^2}{4} + \frac{x}{2} = \frac{x}{4} \left(\frac{3x}{2} + 2\right)$$

$$x^2 - \frac{3x^2}{4} + x - \frac{x}{2} = \left(x - \frac{x}{2}\right) \left(x + \frac{1}{2}\right) + \left(x - \frac{x}{2}\right) = \left(x - \frac{x}{2}\right) \left(x + \frac{1}{2} + 1\right) = \left(x - \frac{x}{2}\right) \left(x + \frac{3}{2}\right) \geq 0$$

$$\frac{x^2 - 2}{4} \geq 0 \rightarrow \frac{-2}{-1} + \frac{2}{1} - \rightarrow Df = [-2, 0] \cup [2, \infty)$$

$$f(x^c + x) = x^r - 1$$

$$f(x) \rightarrow x^r + x = 1 \rightarrow x^c + x - 1 = 0 \rightarrow f(1) \rightarrow x^c + x = 1 \rightarrow x^c + x - 1 = 0$$

$$\frac{x^c + x - 1}{x^r + x - 1} \rightarrow x \leq 1 \quad \frac{x^c + x - 1}{x^r + x - 1} \rightarrow x(1)^r - 1 = 0$$

$$x^c = 1 + (x - 1) \quad (x-1)(x^r + 1 + 2x) + (x-1) \quad (x+1)(x^r + 2x + 1) \geq 0 \rightarrow x \leq 1$$

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$$f(x) + f(1) = 1 + 1 = 2$$

$$x(1)^r - 1 = 0$$

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$$f(x) = x^2 - 4x^2 + 12x \rightarrow f(x) = (x-2)^2 + 1$$

$$(x-2)^2 = x^2 - 4x^2 + 12x - 1$$

$$g(x) = x^2 + 4x^2 + 12x \rightarrow g(x) = (x+2)^2 - 1$$

$$(x+2)^2 = x^2 + 4x^2 + 12x + 1$$

$$\frac{g(\sqrt{V}-2)}{f(\sqrt{V}+2)} = \frac{V-4V}{V+1}$$

$$\frac{-3}{1} = -3$$

$$f(x) = \sqrt{x+2} \sqrt{x-2} \rightarrow \sqrt{x-2} + 2\sqrt{x-2} + 2 = \sqrt{(x-2)+2}^2$$

$$g(x) = \sqrt{x-2} \sqrt{x-2} \rightarrow \sqrt{x-2} - 2\sqrt{x-2} + 2 = \sqrt{(x-2)-2}^2$$

$$f(x) = \sqrt{x-2} + 2$$

$$g(x) = \sqrt{x-2} - 2$$

$$f(x) + g(x) = a + b\sqrt{x+c} \rightarrow \sqrt{x-2} + 2 + \sqrt{x-2} - 2 = 2\sqrt{x-2}$$

$$\frac{a+b}{c} = \frac{0+2}{-2} = \left| \frac{-1}{1} \right|$$

$$\begin{cases} a=0 \\ b=2 \\ c=-2 \end{cases}$$

$$f(x) = \frac{x+2}{x^2-2x+2} \rightarrow \frac{x+2}{(x-1)(x-1)} \rightarrow D_f = R - \{1, 2\}$$

$$g(x) = \left\{ (2, 1), (1, 0), (0, 2), (0, 2) \right\}$$

$$\frac{g}{f} = ? \rightarrow \left\{ (2, -\frac{1}{2}), (0, \frac{2}{1}) \right\} \rightarrow \left\{ (2, -\frac{1}{2}), (0, 2) \right\}$$

$$f(x) = \left\{ (1, 2), (2, -1), (2, 2), (-1, 2) \right\}$$

$$g(x) = \left\{ (-2, 2), (1, -1), (2, 2), (-1, 0) \right\}$$

$$a) f(x) \rightarrow x=1 \rightarrow x=\frac{1}{f} \quad x=2 \rightarrow x=\frac{2}{f} \quad x=2 \rightarrow x=\frac{2}{f} \quad x=-1 \rightarrow x=-\frac{1}{f}$$

$$f(x) = \left\{ (\frac{1}{2}, 2), (\frac{2}{1}, -1), (2, 2), (-\frac{1}{2}, 2) \right\}$$

$$b) f(x) \rightarrow x=1 \rightarrow x=1 \quad x=2 \rightarrow x=2 \quad x=2 \rightarrow x=2 \quad x=-1 \rightarrow x=-1$$

$$f(x) = \left\{ (1, 2), (2, -1), (2, 2) \right\}$$

$$c) f(g(x)+1) = \left\{ (-2, 19), (1, 2), (2, 9), (-1, 1) \right\}$$

$$d) \frac{f}{g} = \left\{ (1, -2), (2, -1), (-1, \frac{2}{0}) \right\} \rightarrow \left\{ (1, -2), (2, -1) \right\}$$

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