

الف)  $f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}} \Rightarrow \sqrt{\frac{x^2-1-x^2}{x^2-x}} = \sqrt{\frac{-2x+1}{x(x-1)}} \xrightarrow{x \neq 1}$

ب)  $f(x) = \frac{\frac{1}{x-1} - \frac{x}{x}}{\frac{x}{x-1} + \frac{1}{x-1}} \Rightarrow \frac{\frac{1-x}{x(x-1)}}{\frac{x+1}{x-1}} = \frac{1-x}{x(x+1)}$

مشتق:  $\frac{1}{x^2+1} - \frac{1}{x^2-1} = \frac{x^2-1-x^2-1}{(x^2+1)(x^2-1)} = \frac{-2}{(x^2+1)(x^2-1)}$

دامنه:  $D_f = (-\infty, 0) \cup (\frac{1}{2}, 1) \cup (1, \infty)$

الف)  $f(x) = \sqrt{(\frac{1}{x}-9)(22-x^2)} = \sqrt{(\frac{22-x^2}{x}-9)(22-x^2)}$

ب)  $\sqrt{x-1} + \sqrt{y+1} = 3 \Rightarrow \sqrt{y+1} = 3 - \sqrt{x-1} \Rightarrow y+1 = 9 - 6\sqrt{x-1} + x-1$

دامنه:  $D_f = (-\infty, -2] \cup [\frac{2}{3}, +\infty)$

$f(x) = \frac{\log_e(x^2-x-2)}{\sqrt{x-1}+1} \Rightarrow \log_e(x^2-x-2) > 0 \Rightarrow (x-2)(x+1) > 0$

همواره مثبت  $\Rightarrow \sqrt{x-1}+1 > 0 \Rightarrow x-1 > 0 \Rightarrow (x+1)(x-1) > 0$

دامنه:  $D_f = (-\infty, -1] \cup [1, +\infty)$

$f(x) = \sqrt{2+qx-x^2}$  شکل سهمی رو به پایین است.  $\Delta > 0 \Rightarrow -x^2+qx+2: q < 0$

دوربین دارد.  $q^2+12 > 0 \Rightarrow q^2 > -12$  همواره برقرار.

از آنجا که ضرب در مثبت یا برابر  $\frac{1}{q} < 0$

$xb = -2 \Rightarrow b = +\frac{2}{x}$

$x^2+qx-x^2 \neq 0 \Rightarrow x^2-qx-x^2=0 \Rightarrow -x(x-q) \Rightarrow q = -x-b$

دامنه:  $[a, b]$  بازه، نزدیک شده

$q+b = -2$

$[(-\infty, -1) \cup (1, \infty)] \cap [(-\infty, -1) \cup [1, +\infty)] = (-\infty, -1) \cup (1, +\infty)$

① ب)

$$\begin{aligned} x+x &\neq 0 \Rightarrow x(x+1) \neq 0 \Rightarrow \begin{matrix} x_1 = 0 \\ x_2 = -1 \end{matrix} \\ x+x &\neq 0 \Rightarrow x = -\infty \Rightarrow x = -\frac{\infty}{\epsilon} = -1, \infty \\ x+x-1 &\neq 0 \Rightarrow (x+1)(x-1) = 0 \Rightarrow \begin{matrix} x_3 = -1 \\ x_4 = 1 \end{matrix} \end{aligned}$$

$$D_f = \mathbb{R} - \{-2, -1, -1/2, 0, 1, 2\}$$

② ص)

$$y = 1 - 4 \sqrt{x-1} + \sqrt{x-1} \Rightarrow D_y = [1, \infty)$$

$$\cos 2\pi = 1$$

$$f(1 + \frac{\sqrt{r}}{r}) \Rightarrow f(\frac{r + \sqrt{r}}{r}) = (r + \sqrt{r})^r - \epsilon + r\sqrt{r}$$

$$6 + 6\sqrt{3} + 9 - 6 + 2\sqrt{3} = \boxed{9 + 2\sqrt{3}}$$

$$f\left(\frac{q+1}{q-1}\right) = q \Rightarrow$$

$f\left(\frac{q+1}{q-1}\right) = q \Rightarrow$

$$\frac{a^y}{a^r} = a \Rightarrow a^y = a^r \Rightarrow y = r$$

$$D_f = \{R - \{1\}\}$$

$$\underline{f(g(a)) = -\epsilon \rightarrow g^Y - \epsilon g = -\epsilon \Rightarrow g^Y - \epsilon + \epsilon = (g - \epsilon)^Y = 0 \Rightarrow}$$

$g(95) = 2$

$$\sqrt{a^2 - 1} = \gamma \Rightarrow a^2 - 1 = \gamma^2 \Rightarrow \boxed{a = \pm \sqrt{\gamma^2 + 1}}$$

$$f(n+r) \cdot \chi_{-2n+r} = (n-r)(n-r)$$

$$f(-3) = f(-4+1) = \overset{-9}{(-4+1)} \overset{-1}{(-4+1)} = 11$$

$$f(\varepsilon) = f(1+r) = \frac{(1-r)}{-r} \frac{(1-r)}{-1} = 2$$

$$f(x) \times f(y) = \sqrt{x} \times \sqrt{y} = \sqrt{xy}$$

$$f(\cos x (t \cos x + \omega)) = \frac{\sin^2 x}{\cos^2 x}$$

$$\sin^2 x = 1 - \cos^2 x \Rightarrow \sin^2 x = 1 - \frac{1}{4} = \frac{3}{4}$$

$$\tan^r = \frac{\sin^r}{\cos^r} \Rightarrow \frac{\frac{1}{2}}{\frac{1}{2}} = \boxed{1}$$

$$\rightarrow R \cos \alpha + 10 \cos \alpha = V \Rightarrow R \cos \alpha + 10 \cos \alpha - V = 0$$

$$\frac{-10 \pm \sqrt{100 + 448}}{14} z \quad \frac{-10 \pm 11}{14} \Rightarrow \cos \alpha = \left\langle \begin{pmatrix} 1 \\ \frac{1}{2} \\ -\frac{\sqrt{3}}{2} \end{pmatrix} \right\rangle \checkmark$$

$$-\frac{\sqrt{e}}{4} \rightarrow \text{میکل نیسے} \rightarrow 1 < \cos \alpha < 1$$

⑤

$$\frac{q+1}{q-1} + 1$$

$$\frac{q+1}{q-1} - 1 = q \Rightarrow$$

$$\frac{a+1+a-1}{a+}$$

$$\frac{q+1-q+1}{q-1} = q \Rightarrow$$

$$\frac{yq}{y} = q \Rightarrow$$

$$D_f = 12 - \sqrt{7}$$