

کوتاهترین کتیف ۵ دفتران ۱۱ (B)

1)  $f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}}$   $x \neq 0, x \neq 1$   
 $(x-1)^2 - x^2 \geq 0$   
 $x(x-1)$

$x^2 + 1 - 2x - x^2 - 1 - 2x \geq 0$   
 $x(x-1)$   
 $D_f = [\frac{1}{2}, 1) \cup (\infty, \infty)$

2)  $f(x) = \frac{1}{x+1} - \frac{2}{x} \rightarrow \frac{x-2x-2}{x(x+1)}$   $x \neq 0, -1, -2, 1$   
 $\frac{3}{x-1} + \frac{1}{x+2} \rightarrow \frac{3(x+2) + (x-1)}{x^2 + 1x - 2} \rightarrow 3x + 6 + x - 1 = 4x + 5 = 0$   
 $x \neq \frac{5}{4}$

$D_f = R - \{-2, -1, 0, 1, \frac{5}{4}\}$

3)  $f(x) = \sqrt{((\frac{1}{3})^x - 9)(32 - 4^x)}$   $32 - 4^x = 0$

$(\frac{1}{3})^x - 9 = 0$   $-2$   
 $\frac{1}{3}^x = 9$   $\frac{1}{3}^x = 3^2$   $x = \frac{5}{2}$

$\infty, -2 \rightarrow +$   $(-2, \frac{5}{2}) \rightarrow -$   $(\frac{5}{2}, \infty) \rightarrow +$   
 $D_f = (\infty, -2] \cup [\frac{5}{2}, \infty)$

4)  $f(x) = \sqrt{x-1} + \sqrt{y+1} = 3 \rightarrow x-1 \geq 0, x \geq 1$

$0 \leq \sqrt{x-1} \leq 3$

$0 \leq x-1 \leq 9$   
 $1 \leq x \leq 10$

$D_f = [1, 10]$

$$(x^2 - x - 2)$$

2

$$f(x) = \frac{\log_r}{\sqrt{x^2-1} + 1}$$

$$x^2-1 > 0 \Rightarrow x^2 > 1 \quad |x| > 1$$

$$x > 1, x < -1$$

$$(x-2)(x+1) \quad \begin{array}{c} -1 \quad 2 \\ + \quad | \quad - \quad | \quad + \\ (x-2)(x+1) \end{array}$$

$$x < -1 \cup x > 2$$

$$(-\infty, -1) \cup (2, \infty)$$

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

$$-x^2 + ax + y > 0 \quad \begin{array}{c} -1 \\ -x^2 + ax + y \end{array}$$

3

$$\frac{-b}{2a} = \frac{-\frac{1}{r}}{-\frac{2}{r}} = \frac{1}{2} \quad \begin{array}{c} x = -\frac{1}{r} \\ -x^2 + ax + y = 0 \end{array}$$

$$-x^2 + ax + y = 0 \quad -\frac{1}{r} + a + y = 0 \quad a = -\frac{1}{r} \quad -\frac{1}{r} + \frac{y}{r} = \frac{y}{r} = 1$$

$$\frac{1}{r} - \frac{1}{r} = -y + x = \frac{y}{r} = x$$

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

$$f(x) = \begin{cases} rx-2 & x > 1 \\ rx+2 & x < 1 \end{cases}$$

4

$$f(x) - x > 0 \quad x > 1 \rightarrow rx - 2 - x > 0 \rightarrow rx - 2 > x \rightarrow x > 1 \cap x > 1$$

$$f(x) - x > 0 \quad x < 1 \rightarrow rx + 2 - x > 0 \rightarrow x + 2 > 0 \quad x > -2 \cap x < 1$$

$$-2 \leq x < 1 \cup x > 1 \rightarrow D_f = [-2, \infty)$$

$$\frac{x^2}{r} + \frac{x}{r} + \sqrt{r}$$

$$f\left(\sin \frac{\pi}{r} + \cos \pi\right) \quad f(x) = rx^2 - rx$$

5

$$r\left(1 + \sqrt{\frac{r}{r}}\right)^2 = r\left(1 + \sqrt{\frac{r}{r}}\right) \rightarrow \frac{r}{r} + r\sqrt{\frac{r}{r}} - \frac{r}{r} - r\sqrt{\frac{r}{r}} = \frac{-1}{r}$$

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

$$f(f(a)) = a$$

$$\frac{a+1+a-1}{a-1} = \frac{2a}{a-1}$$

6

$$f(a) = \frac{a+1}{a-1}$$

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

$$\frac{a+1+a-1}{a-1} = \frac{2}{a-1}$$

MICRO

$$a = \mathbb{R} - \{1\}$$

$$\sqrt{a^2-1} = u$$

$$|a^2-1| - r\sqrt{a^2-1} = -r^2$$

(1)

$$\sqrt{a^2-1} = t$$

$$t^2 - r^2 t + r^2 = 0$$

$$r = \sqrt{a^2-1}$$

$$r = |a^2-1|$$

$$(t-r)(t-r) \quad t=r$$

$$r = a^2-1 \quad a^2 = \omega$$

$$-r = a^2-1 \quad \text{XX}$$

$$a = \pm\sqrt{\omega}$$

$$f(-r) = r^2 + r_0 + r = -Vr$$

$$Vr^2 = 1/r^2$$

(9)

$$f(r) = 1 - \omega + r = r$$

$$f(r \cos^2 \alpha + \omega \cos \alpha) = \tan^2 \alpha$$

$$r \cos^2 \alpha + \omega \cos \alpha - r/\omega = 0$$

(10)

$$(t-r)(t+r) \quad t = \frac{r}{r} - \frac{V}{r} \quad \vec{O} \vec{O} \vec{E}$$

$$r t^2 + \omega t - \frac{V}{r} = 0 \rightarrow t^2 + \omega t - 1/r = 0$$

$$\frac{r}{r} = \cos \alpha \quad \alpha = 90^\circ$$

$$\tan 90^\circ = \sqrt{r} \quad \tan^2 = r$$