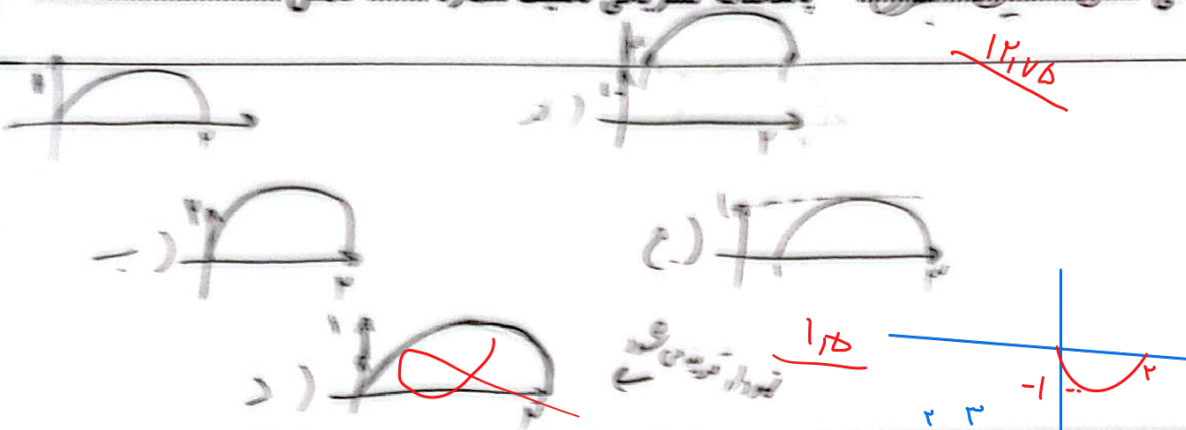




۱)  $x^2 - 4x + 4 > 0 \Rightarrow (x-2)(x-2) > 0 \Rightarrow x < 2 \text{ or } x > 2$   
 $x = 2 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{4 \pm \sqrt{16 - 16}}{2} = \frac{4}{2} = 2$   
 $(x-2)(x-2) > 0 \Rightarrow x < 2 \text{ or } x > 2$   
 $(-\infty, 2) \cup (2, \infty)$

۲)  $x^2 - 9 < 0 \Rightarrow (x-3)(x+3) < 0$   
 $x = 3 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{3 \pm \sqrt{9 - 0}}{2} = \frac{3 \pm 3}{2}$   
 $x = -3 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{3 \pm \sqrt{9 - 0}}{2} = \frac{3 \pm 3}{2}$   
 $(x-3)(x+3) < 0 \Rightarrow -3 < x < 3$   
 $(-3, 3)$

$\frac{x^2 - 4x + 4}{x-2} < 0$   
 $x^2 - 4x + 4 = (x-2)(x-2)$   
 $\frac{(x-2)(x-2)}{x-2} < 0$   
 $(-\infty, 1) \cup (2, \infty)$

$\frac{x^2 - 1}{x^2 - 4x + 4} > 0$   
 $x^2 - 1 = (x-1)(x+1)$   
 $x^2 - 4x + 4 = (x-2)(x-2)$   
 $\frac{(x-1)(x+1)}{(x-2)(x-2)} > 0$   
 $(-\infty, -1) \cup (1, 2) \cup (2, \infty)$

$\frac{(x-1)(x+1)}{x(x-1)} \geq 0$   
 $x \neq 0, x \neq 1$   
 $x \leq -1$   
 $x > 0$   
 $df = (-\infty, -1] \cup (0, 1) \cup (1, \infty)$

$x^2 - 14 = (x-4)(x+4)$   
 $x^2 - 4x + 4 = (x-2)(x-2)$   
 $\frac{(x-4)(x+4)}{(x-2)(x-2)} \geq 0$   
 $\frac{x+4}{x-2} \geq 0$   
 $df = (-\infty, -4] \cup (2, \infty)$

$f: \sqrt{x-2} \geq 0 \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$   
 $\sqrt{x-2} \leq 4 \Rightarrow x-2 \leq 16 \Rightarrow x \leq 18$   
 $x \leq 18$   
 $df = [2, 18]$

$y = \sqrt{x-2} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$   
 $x-2 \geq 0 \Rightarrow x \geq 2$   
 $df = [2, \infty)$

$$|x - y| > 0$$

$$x > y \text{ or } x < y$$

$$x > y \rightarrow -\sqrt{r} < x < \sqrt{r}$$

$$x > y \rightarrow x \in (-\sqrt{r}, \sqrt{r})$$

$$D_f = [-\sqrt{r}, \sqrt{r}]$$

$$|x - y| > 0$$

$$x \in (-\sqrt{r}, \sqrt{r})$$

$$|x| \geq r \rightarrow x \geq r \text{ or } x \leq -r$$

$$D_f = (-\infty, -r] \cup [r, +\infty)$$

$$D_f = [-\sqrt{r}, \sqrt{r}]$$

$$|x - y| \neq 0$$

$$|x| \neq y$$

$$x \neq y \text{ or } x \neq -y$$

$$D_f = \mathbb{R} - \{y, -y\}$$

$$x > 0$$

$$|x - y| \neq 0$$

$$|x| \neq y \rightarrow x \neq y$$

$$|x| \neq -y$$

$$D_f = [0, +\infty) - \{y\}$$

$$x \neq -y$$

$$D_f = [0, +\infty) - \{y\}$$

$$a) \cos x - 1 \neq 0 \quad \cos x \neq 1 \quad x \neq 2k\pi \quad D = \mathbb{R} - \{2k\pi\} \quad x \in \mathbb{Z}$$

$$b) \sin x + 1 \neq 0 \quad \sin x \neq -1 \quad x \neq \frac{3\pi}{2} + 2k\pi \quad D = \mathbb{R} - \{\frac{3\pi}{2} + 2k\pi\}$$

$$c) \cot x - 1 \rightarrow \sin x \neq 0 \quad \cos x \neq 0 \quad x \neq \frac{k\pi}{2} \quad D = \mathbb{R} - \{\frac{k\pi}{2}\}$$

$$d) \sin^2 x - y \neq 0 \quad \sin^2 x \neq y \quad \sin x \neq \pm \sqrt{y} \quad D = \mathbb{R} - \{\frac{\pi}{2}, \frac{3\pi}{2}\}$$

$$|x - y| > \frac{1}{f}$$

$$|x - y| > \frac{1}{f}$$

$$x - y < -\frac{1}{f} \text{ or } x - y > \frac{1}{f}$$

$$x < y - \frac{1}{f} \text{ or } x > y + \frac{1}{f}$$

$$D = (-\infty, y - \frac{1}{f}) \cup (y + \frac{1}{f}, +\infty)$$

$$f - y|x| > 0$$

$$|x| \leq \frac{f}{y}$$

$$|x| \leq \frac{f}{y}$$

$$D_f = [-\frac{f}{y}, \frac{f}{y}]$$

$$|x| \neq 0 \quad x \neq 0$$

$$y = x = 1$$

$$D_f = \mathbb{R} - \{0\}$$

$$D_f = \mathbb{R} - \{0\}$$