

N 253 pg 76

$$\log_5 \frac{x^3 \cdot 5^x}{5^{x^3}} = x - x^3 + 3 \log_5 x$$

$$\log_5 x^3 + \log_5 5^x - \log_5 5^{x^3} = x - x^3 + 3 \log_5 x$$

$$3 \log_5 x + x \log_5 5 - x^3 \log_5 5 = x - x^3 + 3 \log_5 x$$

$$3 \log_5 x + x - x^3 = x - x^3 + 3 \log_5 x$$

N 269

$$\log_a (x^2 - 9) = \log_a (x - 3) + \log_a (x + 3)$$

$$x^2 - 9 > 0$$

$$x^2 = 9$$

$$x = \pm 3$$

$$(-\infty; -3) \cup (3; +\infty)$$

$$\begin{cases} x - 3 > 0 \\ x + 3 > 0 \end{cases}$$

$$\begin{cases} x > 3 \\ x > -3 \end{cases}$$

$$(3; +\infty)$$

$$S(3; +\infty)$$

N 297

$$\log_{\frac{3}{8}} x = -2$$

$$CE: x > 0$$

$$\begin{cases} x > 0 \\ x = \left(\frac{3}{8}\right)^{-2} \end{cases}$$

$$\begin{cases} x > 0 \\ x = \frac{64}{9} \end{cases}$$

N 398

$$\log_2 (\log_{10} (x-1)) = 1$$

$$CE \begin{cases} x - 1 > 0 \\ \log_{10} (x-1) > 0 \end{cases}$$

$$\begin{cases} x > 2 \end{cases}$$

$$\begin{cases} x > 1 \\ x - 1 > 1 \end{cases}$$

$$\begin{cases} \log_2 (\log_{10} (x-1)) = 1 \end{cases}$$

$$\begin{cases} x > 1 \\ x > 2 \end{cases}$$

$$\begin{cases} x > 2 \end{cases}$$

$$\begin{cases} x > 2 \end{cases}$$

$$\begin{cases} x > 2 \end{cases}$$

$$CE: x > 2$$

$$\begin{cases} \log_{10} (x-1) = 2 \end{cases}$$

$$\begin{cases} (x-1) = 100 \end{cases}$$

$$\begin{cases} (x=101) \end{cases}$$

N 318

$$\frac{\log_a(10-x)}{\log_a(4-x)} = 2$$

$$\begin{cases} x < 4 \end{cases}$$

$$\begin{cases} \log_a(10-x) = 2 \log_a(4-x) \end{cases}$$

$$\begin{cases} \log_a(10-x) = 2 \log_a(4-x) \\ x < 4 \\ x \neq 3 \end{cases}$$

$$\begin{cases} \log_a(10-x) = \log_a(4-x)^2 \\ x < 4 \\ x \neq 3 \end{cases}$$

$$\begin{cases} 10-x = (4-x)^2 \\ x < 4 \\ x \neq 3 \end{cases}$$

$$\begin{cases} x^2 - 7x + 6 = 0 \\ x < 4 \\ x \neq 3 \end{cases}$$

$$x = 1$$

CE

$$\begin{cases} 10-x > 0 \\ 4-x > 0 \end{cases}$$

$$\begin{cases} x < 10 \\ x < 4 \end{cases}$$

$$\begin{cases} x < 4 \\ \log_a(4-x) \neq 0 \end{cases}$$

$$\begin{cases} x < 4 \\ (4-x) \neq 1 \\ x < 4 \\ x \neq 3 \end{cases}$$

$$\begin{cases} 10-x - x^2 - 16 + 8x = 0 \\ x < 4 \\ x \neq 3 \end{cases}$$

$$x_{1/2} = \frac{7 \pm \sqrt{49 - 24}}{2} = \frac{7 \pm \sqrt{25}}{2} = \frac{7 \pm 5}{2}$$

∴

N 278

$$\log_a \sqrt{x} = \frac{1}{2} \log_a x$$

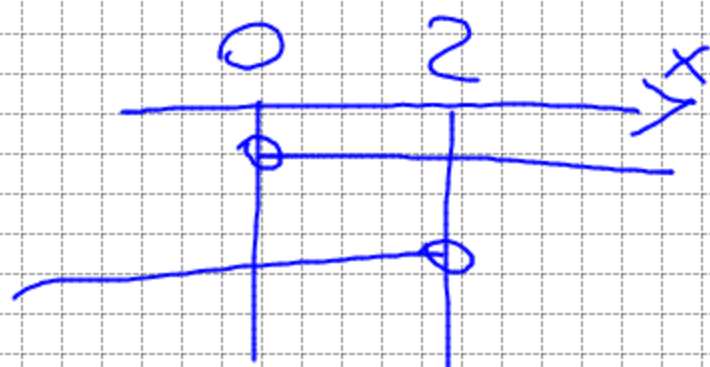
$$\begin{cases} \sqrt{x} > 0 \\ x > 0 \end{cases}$$

369

$$\log_4 x < \frac{1}{2}$$

$$\begin{cases} x > 0 \\ x < 4^{\frac{1}{2}} \end{cases}$$

$$\begin{cases} x > 0 \\ x < 2 \end{cases}$$



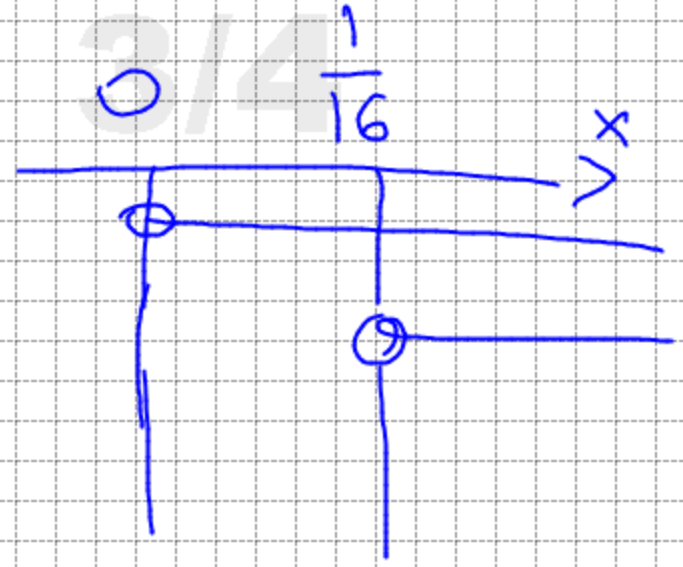
(0; 2)

371

$$\log_{\frac{1}{2}} x < 4$$

$$\begin{cases} x > 0 \\ x > \left(\frac{1}{2}\right)^4 \end{cases}$$

$$\begin{cases} x > 0 \\ x > \frac{1}{16} \end{cases}$$



$$\left(\frac{1}{16}, +\infty\right)$$

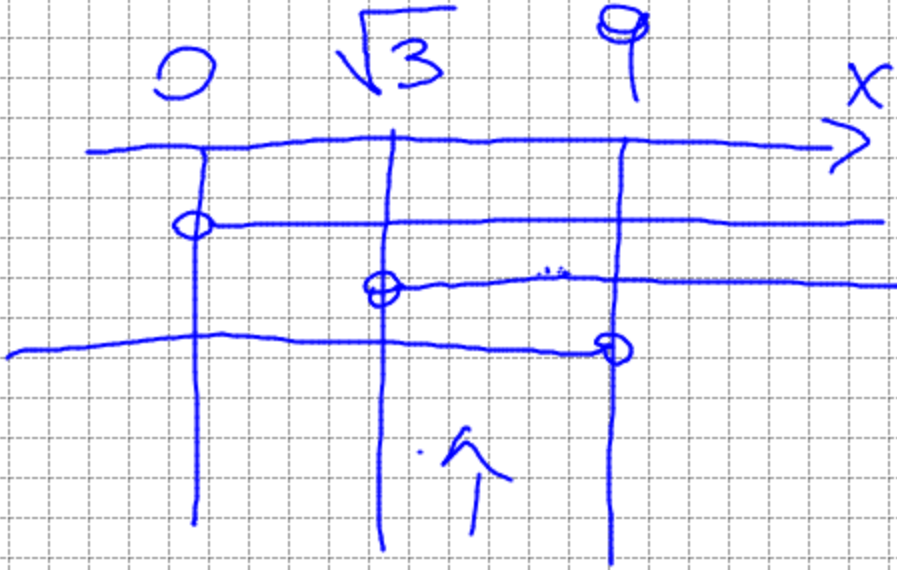
N 378

$$\frac{1}{2} < \log_3 x < 2$$

$$\begin{cases} x > 0 \\ \log_3 x > \frac{1}{2} \\ \log_3 x < 2 \end{cases}$$

$$\begin{cases} x > 0 \\ x > (3)^{\frac{1}{2}} \\ x < 3^2 \end{cases}$$

$$\begin{cases} x > 0 \\ x > \sqrt{3} \\ x < 9 \end{cases}$$



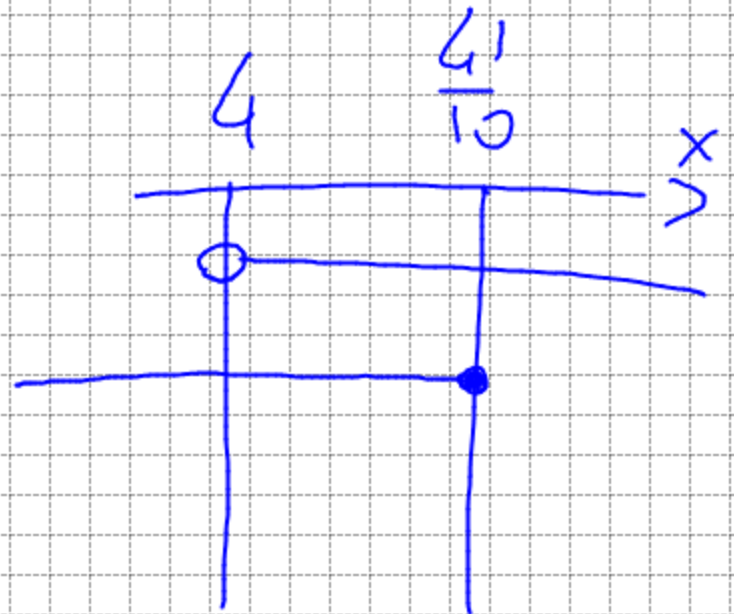
$$(\sqrt{3}, 9)$$

383

$$\log_{\frac{1}{10}} (x-4) \geq 1$$

$$\begin{cases} x > 4 \\ x-4 \leq \frac{1}{10} \end{cases}$$

$$\begin{cases} x > 4 \\ x \leq \frac{41}{10} \end{cases}$$



$$\left(4, \frac{41}{10}\right]$$

391

$$\log_2 \frac{x+3}{x} > 1$$

$$\left\{ \begin{array}{l} x < 3 \cup x > 0 \\ \frac{x+3}{x} > 2 \end{array} \right.$$

$$\frac{x+3}{x} > 2$$

$$x < 3 \cup x > 0$$

$$\frac{x+3-2x}{x} > 0$$

$$\frac{3-x}{x} > 0$$

$$N \quad 3-x > 0$$

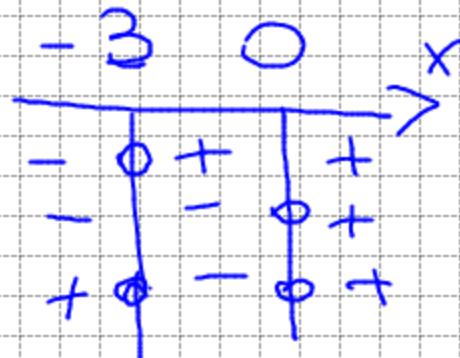
$$x < 3$$

$$D \quad x > 0$$

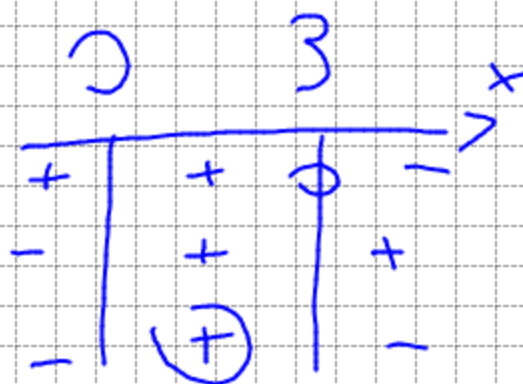
$$CE \quad \frac{x+3}{x} > 0$$

$$N > 0 \quad x > -3$$

$$D > 0 \quad x > 0$$



$$(-\infty, -3) \cup (0, +\infty)$$



$$(0, 3)$$