

$$1) \log_3^2 x - 4 \log_3 x + 3 = 0$$

Пусть  $\log_3 x = t$ , тогда

$$t^2 - 4t + 3 = 0$$

$$t_1 = 3 \quad t_2 = 1$$

$$\log_3 x_1 = 3 \quad x_1 = 3^3 = 27$$

$$\log_3 x_2 = 1 \quad x_2 = 3^1 = 3$$

$$2) \lg^2 x - \lg x^2 - 3 = 0 \Rightarrow \lg^2 x - 2 \lg x - 3 = 0$$

$$\lg x = t \Rightarrow t^2 - 2t - 3 = 0 \quad t_1 = 3 \quad t_2 = -1$$

Т.к.  $\log_a x > 0$ , то  $t = 3$  и

$$\lg x = 3 \Rightarrow x = 10^3 = 1000$$

$$3) \log_5^2 x^3 - 10 \log_5 x + 1 = 0 \Rightarrow$$

$$9 \log_5^2 x - 10 \log_5 x + 1 = 0 \quad \log_5 x = t$$

$$9t^2 - 10t + 1 = 0 \quad t_{1,2} = \frac{10 \pm \sqrt{100 - 36}}{18} =$$

$$= \frac{10 \pm 8}{18} \quad t_1 = \frac{2}{18} = \frac{1}{9} \quad t_2 = \frac{18}{18} = 1$$

$$\log_5 x_1 = \frac{1}{9} \quad x_1 = \sqrt[9]{5} \quad \log_5 x_2 = 1 \quad x_2 = 5$$