3) задание

1) $2^x = 256$

$2^x = 2^8$

$x = 8$

2) $2^x = 300$

$\log_2 2^x = \log_2 300 = \log_2 \cdot 5^2 2^2 \cdot 3$

$x = \log_2 5^2 + \log_2 2^2 + \log_2 3$

$x = 2\log_2 5 + 2 + \log_2 3$

или $x = \log_2 300$

3) $\log_8 2^{8x-4} = 4$

$2^{8x-4} = 8^4$

$2^{8x-4} = (2^3)^4$

$2^{8x-4} = 2^{12}$

$8x - 4 = 12$

$8x = 16$

$x = 2$

4) $3^{\log_9(5x-5)} = 5$, $5x - 5 > 0 \to x > 1$

$\log_9(5x-5) = a \Rightarrow 3^a = 5 \to \log_3 3^a = \log_3 5 \Rightarrow a = \log_3 5$

$\log_9(5x-5) = \log_3 5$

$\log_9(5x-5) = \log_9 25$

$5x - 5 = 25$

$5x = 30$

$x = 6$

5) $x^{\log_3 x + 1} = 9$, $x > 0$

$\log_3 x^{\log_3 x + 1} = \log_3 9$

$(\log_3 x + 1) \cdot \log_3 x = 2$

$\log_3 x = a$,

$a^2 + a - 2 = 0$

$a_1 = -2$, $a_2 = 1$

$\log_3 x = -2$ или $\log_3 x = 1$

$x = \frac{1}{9}$ или $x = 3$