$$а) log\_{2}\left(12-2^{x}\right)=5-x; log\_{2} \left(12-2^{x}\right)=log\_{2}2^{5-x}$$

$$12-2^{x}=2^{5-x}; 2^{5-x}+2^{x}-12=0; Пусть 2^{x}=t, t>0. Тогда 2^{5}\*t^{-1}+t-12=0 \_{}$$

$$\frac{t^{2}-12t+32}{t}=0; t^{2}-12t+32=0$$

$$D=144-4\*1\*32=144-128=16,$$

$$t=\frac{12\mp 4}{2}, x=\frac{8}{2}=4, x=\frac{16}{2}=8$$

$$ log\_{2}x=4; x=2^{4}=16$$

$$log\_{2}x=8; x=2^{8}=256$$

Ответ 16, 256

$$б) log\_{2}\left(3-x\right)+ log\_{2}\left(1-x\right)=3$$

Область допустимых значений: $\left\{\begin{array}{c}3-x>0 \\1-x>0.\end{array} \right. \left\{\begin{array}{c}x<3 \\x<1.\end{array} \right.^{}x<1$

$$ log\_{2}\left(\left(3-x\right)\*\left(1-x\right)\right)=3; log\_{2}\left(3-3x-x+x^{2}\right)=log\_{2}2^{3}; x^{2}-4x+3=8;$$

$ x^{2}-4x-5= 0$

$$D=16-4\*1\*\left(-5\right)=16+20=36,$$

$$x=\frac{4\mp 6}{2}, x=\frac{-2}{2}=-1, x=\frac{10}{2}=5 не входит в ОДЗ$$

$$ $$

Ответ : -5

в)$ log\_{4}\left(x+12\right)\*log\_{x}2=1; Область допустимых значений:x>0, x\ne 1,$

$$log\_{4}\left(x+12\right)\*\frac{1}{log\_{2}x}=1; log\_{4}\left(x+12\right)=log\_{2}x; \frac{1}{2}log\_{2}\left(x+12\right)=log\_{2}x; $$

$$log\_{2}\sqrt{\left(x+12\right)}=log\_{2}x; \sqrt{x+12}=x; x+12=x^{2}; x^{2}-x-12=0$$

$$D=1-4\*1\*\left(-12\right)=1+48=49,$$

$$x=\frac{1\mp 7}{2}, x=\frac{8}{2}=4, x=\frac{-6}{2}=-3 не входит в ОДЗ$$

Ответ : 4.

г)$ log\_{3}\left(x^{2}-6\right)=log\_{3}\left(x-2\right)+1$

Область допустимых значений: $\left\{\begin{array}{c}x^{2}-6>0 \\x-2>0.\end{array} \right. \left\{\begin{array}{c}\left[\begin{array}{c}x<-\sqrt{6}\\x>\sqrt{6}\end{array}\right.\\x>2\end{array}\right. x<\sqrt{6}$

 $log\_{3}\left(x^{2}-6\right)=log\_{3}\left(x-2\right)+log\_{3}3; log\_{3}\left(x^{2}-6\right)=log\_{3}\left(3\*\left(x-2\right)\right); $

$$x^{2}-6=3x-6; x^{2}-6-3x+6=0; x^{2}-3x=0; x\left(x-3\right)=0;$$

$$x=3, x=0 не входит в ОДЗ$$

Ответ 3.