$$1-\frac{3-2x}{5-x}=\frac{3}{3-x}-\frac{x+3}{x+1}$$

Отметим ОДЗ.

$$\begin{cases} 5-x\neq 0\ (1) \\ 3-x\neq 0\ (2) \\ x+1\neq 0\ (3) \end{cases}$$

$$1-\frac{3-2x}{5-x}-\frac{3}{3-x}+\frac{x+3}{x+1}=0$$

$$1-\frac{2x-3}{x-5}+\frac{3}{x-3}+\frac{x+3}{x+1}=0$$

$$1-\frac{(2x-3)(x-3)(x+1)}{(x-5)(x-3)(x+1)}+\frac{3(x-5)(x+1)}{(x-3)(x-5)(x+1)}+\frac{(x+3)(x-5)(x-3)}{(x+1)(x-5)(x-3)}=0$$

$$1+\frac{-(2x-3)(x-3)(x+1)+3(x-5)(x+1)+(x+3)(x-5)(x-3)}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-\left(2x^2-6x-3x+9\right)(x+1)+(3x-15)(x+1)+\left(x^2-5x+3x-15\right)(x-3)}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-\left(2x^2-9x+9\right)(x+1)+(3x-15)(x+1)+\left(x^2-2x-15\right)(x-3)}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-\left(2x^3+2x^2-9x^2-9x+9x+9\right)+\left(3x^2+3x-15x-15\right)+\left(x^3-3x^2-2x^2+6x-15x+45\right)}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-\left(2x^3-7x^2+9\right)+\left(3x^2-12x-15\right)+\left(x^3-5x^2-9x+45\right)}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-2x^3+7x^2-9+3x^2-12x-15+x^3-5x^2-9x+45}{(x-5)(x-3)(x+1)}=0$$

$$1+\frac{-x^3+5x^2+21-21x}{(x-5)(x-3)(x+1)}=0$$

$$\frac{(x-5)(x-3)(x+1)}{(x-5)(x-3)(x+1)}+\frac{-x^3+5x^2+21-21x}{(x-5)(x-3)(x+1)}=0$$

$$\frac{(x-5)(x-3)(x+1)+\left(-x^3+5x^2+21-21x\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{\left(x^2-3x-5x+15\right)(x+1)+\left(-x^3+5x^2+21-21x\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{\left(x^2-8x+15\right)(x+1)+\left(-x^3+5x^2-21x+21\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{\left(x^3+x^2-8x^2-8x+15x+15\right)+\left(-x^3+5x^2-21x+21\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{\left(x^3-7x^2+7x+15\right)+\left(-x^3+5x^2-21x+21\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{x^3-7x^2+7x+15-x^3+5x^2-21x+21}{(x-5)(x-3)(x+1)}=0$$

$$\frac{-2x^2-14x+36}{(x-5)(x-3)(x+1)}=0$$

$$-\frac{2x^2+14x-36}{(x-5)(x-3)(x+1)}=0$$

$$-\frac{2\left(x^2+7x-18\right)}{(x-5)(x-3)(x+1)}=0$$

$$\frac{2\left(x^2+7x-18\right)}{(x-5)(x-3)(x+1)}=0$$

Дробь обращается в нуль тогда, когда числитель равен нулю.

$$x^2+7x-18=0$$

Находим дискриминант.

$$D=b^2-4ac=7^2-4\cdot 1(-18)=121$$

$$x_{1,2}=\frac{-b\pm\sqrt{D}}{2a}$$

$x_1=\frac{-7-11}{2\cdot 1}=-9$; $x_2=\frac{-7+11}{2\cdot 1}=2$

x=-9 удовлетворяет ОДЗ.

x=2 удовлетворяет ОДЗ.

ответ: x=-9;x=2 .