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

$$\frac{3(x+2)}{x(x+2)}+\frac{1(x)}{x(x+2)}=1$$ get common denominator

$$\frac{3(x+2)+x}{x(x+2)}=1$$ combine the fractions over the common denominator

$$\frac{4x+6}{x(x+2)}=1$$ simplify the numerator

$$(x(x+2))\frac{4x+6}{x(x+2)}=1(x(x+2))$$ multiply both sides by the denominator

$4x+6=1(x(x+2))$ the denominator cancels on the left.

$4x+6=x^2+2x$ simplify the right side

$6=x^2-2x$ combine x terms on one side of the equation

$0=x^2-2x-6$ move the 6 over and set the whole equation equal to zero so that you now have a quadratic equation that you can solve with the Quadratic formula.

Quadratic Formula:

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

a = 1
b = -1
c = -6

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-6)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{4 + 24}}{2}$$

$$x = \frac{2 \pm 2\sqrt{7}}{2} = 1 \pm \sqrt{7}$$

$$x = 3.65 \ \ and \ \ -1.65$$