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$$(x-3)\cdot y = \frac{x+1}{x-3}\cdot(x-3)$$

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Since x is in our equation twice, let's get x to one side and everything without x to the other by Subtracting xy and 1 from both sides:

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Changing the roles of x and y gives the inverse: $y = f^{-1}(x) = \frac{-3x-1}{1-x}$