Inverse of Linear Functions

The procedure for finding the inverse of a linear function is fairly basic.

1. Switch “x” and “y”.
2. Solve for “y”.

Example: Find the inverse ($f^{-1}(x)$) of $f(x)=\frac{4-6x}{7}$**:** This means $y=\frac{4-6x}{7}$, so switch “x” and “y”: $x=\frac{4-6y}{7}$. Now, solve back for y: $7\bullet x=\frac{4-6y}{\not 7}\bullet \not 7$

$7x-4=\not 4-6y-\not 4 \quad \Rightarrow \quad \frac{7x-4}{-6}=\frac{\not -\not 6 y}{\not -\not 6} \quad \Rightarrow \quad \frac{7x-4}{-6}=y=f^{-1}(x)$

Find $f^{-1}(x)$ of each linear function.

1. $f(x)=4x-5$
2. $f(x)=\frac{x}{6}$
3. $f(x)=\frac{2x}{5}+4$
4. $f(x)=\frac{2x-5}{4}$
5. $f(x)=\frac{4x+7}{2}$
6. $f(x)=12-\frac{3}{4}x$
7. $f(x)=\frac{8-3x}{13}$
8. $f(x)=\frac{-3x+4}{-9}$
9. $f(x)=\frac{3x}{7}$
10. $f(x)=\frac{9x-1}{-8}$
11. $f(x)=\frac{15x-13}{21}$
12. $f(x)=\frac{7.6x+3.2}{8.5}$
13. $f(x)=\frac{9x+5}{7}$
14. $f(x)=\frac{6x-16}{-5}$
15. $f(x)=\frac{-x-1}{-2}$
16. $f(x)=9-5x$

Answers: 1. $f^{-1}(x) = \frac{x+5}{4}$ 2. $f^{-1}(x) = 6x$ 3. $f^{-1}(x) = \frac{5(x-4)}{2}$ 4. $f^{-1}(x) = \frac{4x+5}{2}$

5. $f^{-1}(x) = \frac{2x-7}{4}$ 6. $f^{-1}(x) = \frac{4(x-12)}{-3}$ 7. $f^{-1}(x) = \frac{13x-8}{-3}$

8. $f^{-1}(x) = \frac{-9x-4}{-3} = \frac{9x+4}{3}$ 9. $f^{-1}(x) = \frac{7x}{3}$ 10. $f^{-1}(x) = \frac{-8x+1}{9}$

11. $f^{-1}(x) = \frac{21x+13}{15}$ 12. $f^{-1}(x) = \frac{8.5x-3.2}{7.6}$ 13. $f^{-1}(x) = \frac{7x-5}{9}$

14. $f^{-1}(x) = \frac{-5x+16}{6}$ 15. $f^{-1}(x) = 2x-1$ 16. $f^{-1}(x) = \frac{x-9}{-5}$