Inverse Function Practice Problem 1
Math 130 Kovitz

Let \( f(x) = \frac{4x - 5}{x - 4} \)

1. Find \( f^{-1}(x) \)

2. Find
   (a) \( f(2) \)
   (b) \( f^{-1}(2) \)

3. Find
   (a) \( f^{-1}(f(2)) \)
   (b) \( f(f^{-1}(2)) \)

4. True or false: \( f \) is its own inverse
   (i.e. \( f \) is symmetric with respect to the line \( y = x \)).

5. Take any point on \( f(x) \). Reflect it across the line \( y = x \).
   Is the resulting point on \( f \)?
   Is the resulting point on \( f^{-1} \)?

ANSWERS FOLLOW
Answers.

1. $f^{-1}(x) = \frac{4x - 5}{x - 4}$.

2. (a) $f(2) = -3/2$.
   (b) $f^{-1}(2) = -3/2$.

3. (a) 2.
   (b) 2.

4. True.

5. An example would be choosing the point $(5, 15)$. Its reflection across the line $y = x$ is the point $(15, 5)$.
   The resulting point $(15, 5)$ is on $f$ since $5 = \frac{4(15) - 5}{15 - 4}$ because $5 = \frac{55}{11}$.
   Since $f$ and $f^{-1}$ are the same function the point is certainly on $f^{-1}$.