Inverse Function Practice Problem 1

Math 130 *Kovitz*

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

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

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 $5 = 55/11$.

   Since f and f^{-1} are the same function the point is certainly on f^{-1}.