

Functions

$$f(x) = 3x - 5$$

$$x \in R, -6 < x < 3$$

$$f(x) = \frac{2}{x - 1}$$

$$x \in R, x \neq 1$$

$$f(x) = \frac{2x + 1}{x + 1}$$

$$x \in R, x \neq -1$$

For each function:

1. Sketch $f(x)$
2. Find $f^{-1}(x)$
3. Sketch $f^{-1}(x)$
4. Solve $f(x) = f^{-1}(x)$

Functions - Answers

$$f(x) = 3x - 5$$

$$x \in R, -6 < x < 3$$

1. Sketch $f(x)$
2. Find $f^{-1}(x)$

$$f^{-1}(x) = \frac{x + 5}{3}$$

3. Sketch $f^{-1}(x)$
4. Solve $f(x) = f^{-1}(x)$

$$3x - 5 = x$$

$$2x = 5$$

$$x = \frac{5}{2}$$

$$f(x) = \frac{2}{x - 1}$$

$$x \in R, x \neq 1$$

$$f^{-1}(x) = \frac{2}{x} + 1$$

$$x = \frac{2}{x - 1}$$

$$x^2 - x - 2 = 0$$

$$(x - 2)(x + 1) = 0$$

$$x = 2, x = -1$$

$$f(x) = \frac{2x + 1}{x + 1}$$

$$x \in R, x \neq -1$$

$$f^{-1}(x) = \frac{1 - x}{x - 2} = \frac{x - 1}{2 - x}$$

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

$$x^2 + x = 2x + 1$$

$$x^2 - x - 1 = 0$$

$$x = 1.62, x = -0.62$$