FUNCTIONS 4: QUIZ SOLUTIONS

Question 1

If $f(x) = 3x + 6$, then what is the equation of its inverse?

Solution

$$f(x) = 3x + 6$$

$$\text{Put } x = 3y + 6$$

$$\therefore y = \tfrac{1}{3}x - 2 = f^{-1}(x)$$

Question 2

If $f(x) = 9 - 3x$, then what is the equation of its inverse?

Solution

$$f(x) = 9 - 3x$$

$$\text{Put } x = 9 - 3y$$

$$\therefore y = 3 - \tfrac{1}{3}x = f^{-1}(x)$$

Question 3

What is the equation of the inverse of $f(x) = 5x - 2$?

Solution

$$f(x) = 5x - 2$$

$$\text{Put } x = 5y - 2$$

$$\therefore y = \tfrac{1}{5}x + \tfrac{2}{5} = f^{-1}(x)$$

Question 4

If $f(x) = \tfrac{1}{2}x + \tfrac{5}{3}$, what is $f^{-1}(x)$?

Solution

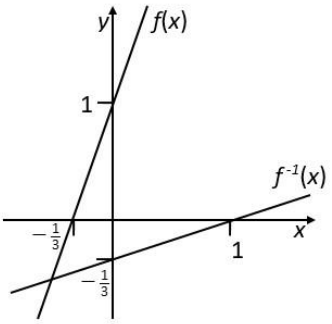
$$f(x) = \tfrac{1}{2}x + \tfrac{5}{3}$$

$$\text{Put } x = \tfrac{1}{2}y + \tfrac{5}{3}$$

$$\therefore y = 2x - \tfrac{10}{3} = f^{-1}(x)$$

Question 5

What are the equations of the function and its inverse as shown in the following graph?



Solution

The graph of $f(x)$ passes through the points $\left(-\frac{1}{3};\ 0\right)$ and (0; 1). So $f(x)=3x+1$.

The graph of $f^{-1}(x)$ passes through the points $\left(0;\ -\frac{1}{3}\right)$ and (1; 0). So $f^{-1}(x)=\frac{1}{3}x-\frac{1}{3}$.