Answer on Question#44082 – Math – Algebra

find the inverse and graph all:

f(x)=(4-x)/(3+y)

f(x)=2x-4

f(x)=square root x+1

g(x)=x^2+x-1

Solution.

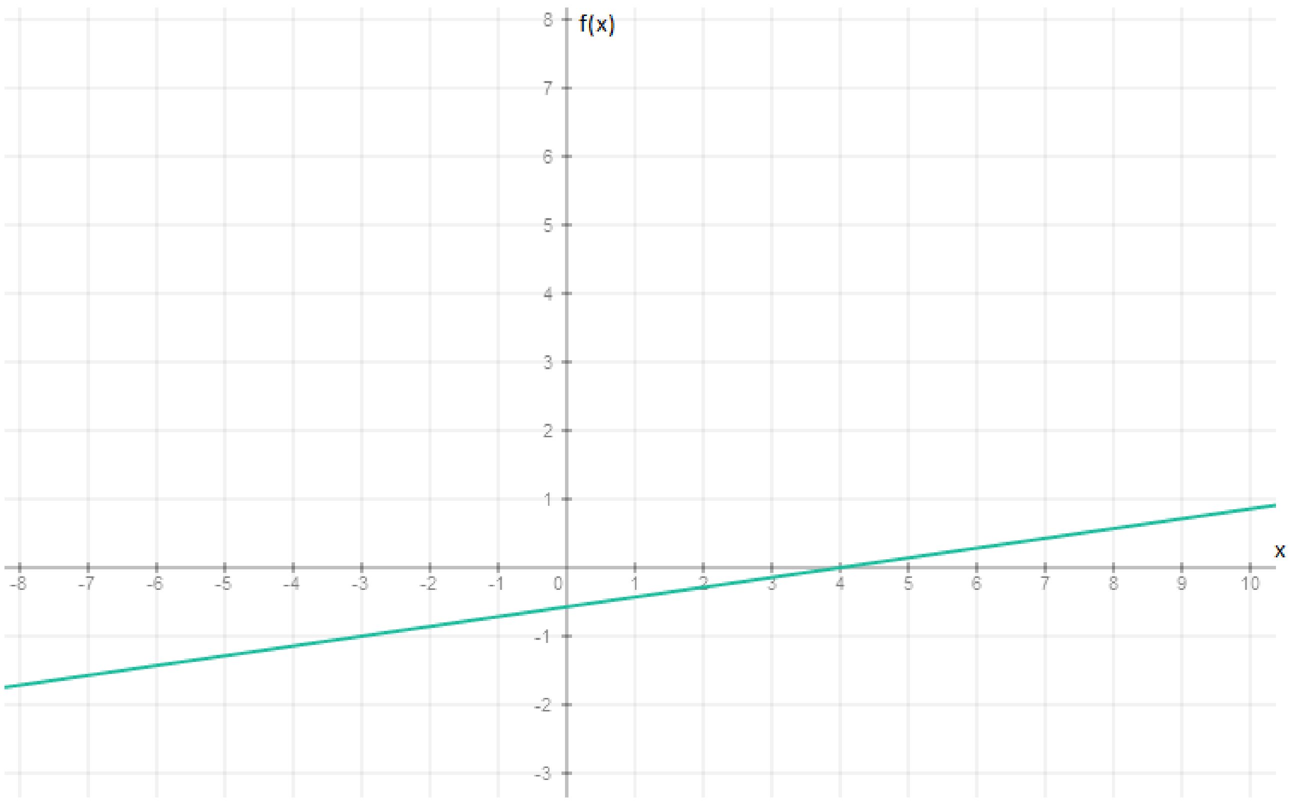
a) $f(x) = \frac{4-x}{3+y}$. Let's denote $\frac{4-x}{3+y} = z,$ hence

$$4 - x = z(3 + y)$$

$$x = 4 - z(3 + y)$$

So, the inverse function for $f(x) = \frac{4-x}{3+y}$ is g(x)=$4 - x(3 + y)$.

The graph when y=10:

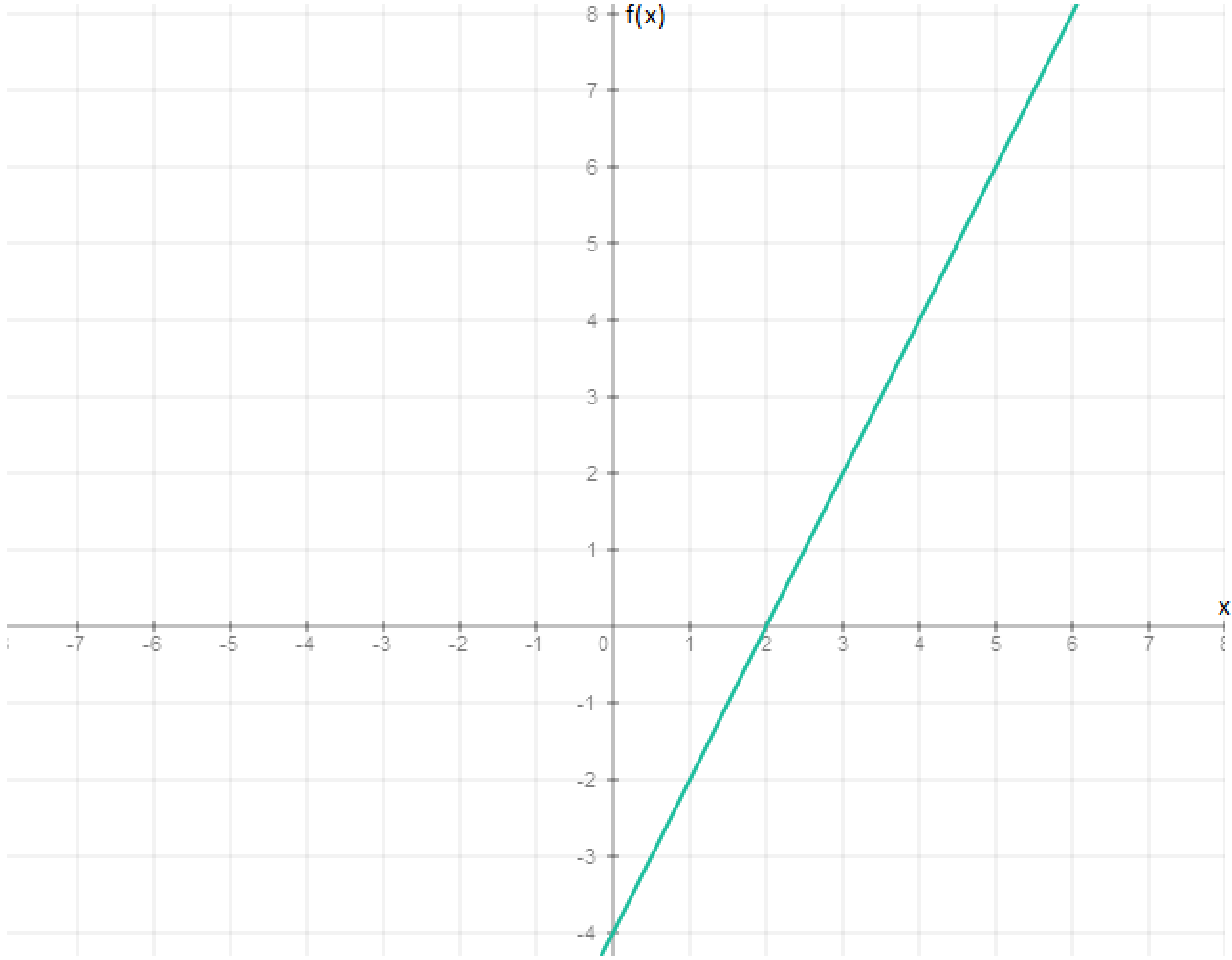


b) f(x)=2x-4. As in previous case let's denote $2x - 4 = z,$ hence

$$2x = z + 4$$
$$x = \frac{z}{2} + 2$$

So, the inverse function for $f(x) = 2x - 4$ is g(x)=$\frac{x}{2} + 2$.

The graph:

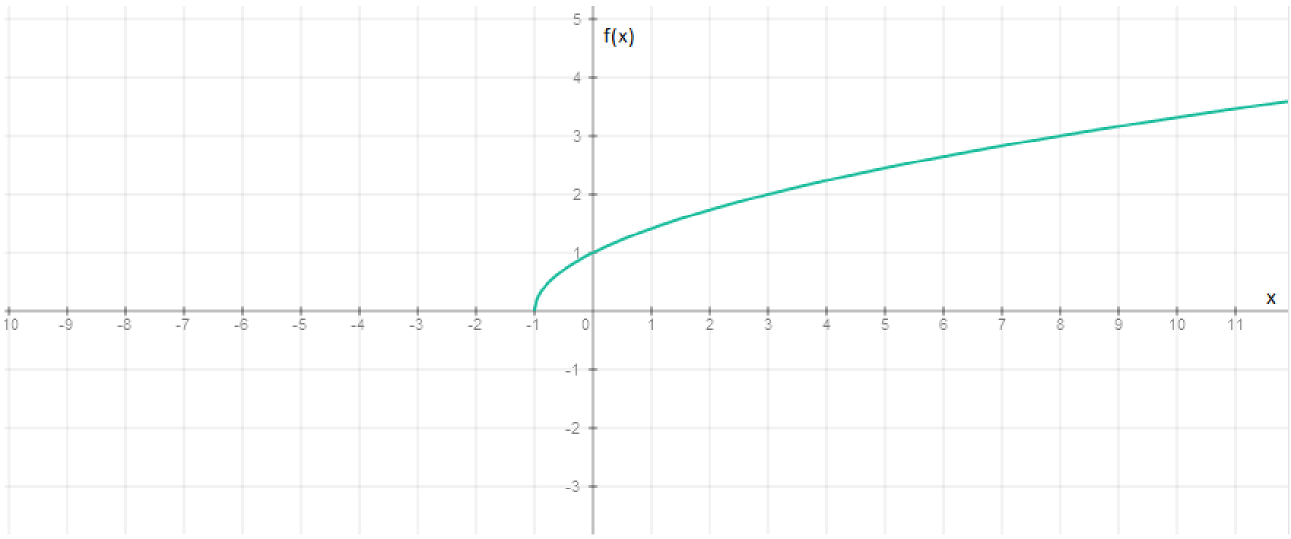


c) $f(x) = \sqrt{x+1}$. As in previous cases let's denote $\sqrt{x+1} = z$, hence

$$x + 1 = z^2$$
$$x = z^2 - 1, z \in [0, +\infty).$$

So, the inverse function for $f(x) = \sqrt{x+1}$ is g(x)=$x^2 - 1, x \in [0, +\infty)$.

The graph:



d) $f(x) = x^2 + x - 1$. As in previous cases let's denote $x^2 + x - 1 = z$, hence

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

$$D = b^2 - 4ac = 1 + 4(z + 1) = 4z + 5;$$

$$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a} = \frac{-1 \pm \sqrt{4z + 5}}{2};$$

So, this function do not have inverse function on the whole $\mathbb{R}$.

The graph: