$$y = \frac{2x}{3} + 1$$

$$y - 1 = \frac{2x}{3}$$

$$3(y-1) = 2x$$

$$\frac{3(y-1)}{2} = x$$

But $f(x) = y \Rightarrow$

$$f^{-1}(f(x)) = f^{-1}(y) \Rightarrow$$

$$x = f^{-1}(y)$$

So $\boxed{f^{-1}(y) = \dfrac{3(y-1)}{2}}$