We prove that the horizontal asymptote of $y = \frac{2x+3}{9x+1}$ is $y = \frac{2}{9}$.

We need to find an oblique asymptote $y = kx + b$ of the graph of the function $y = f(x)$, where

$$k = \lim_{x \to +\infty} \frac{f(x)}{x} = \lim_{x \to +\infty} \frac{(2x+3)}{x(9x+1)} = 0, \ b = \lim_{x \to +\infty} (f(x) - kx) = \lim_{x \to +\infty} f(x) = \lim_{x \to +\infty} \frac{2x+3}{9x+1} = \frac{2}{9}.$$

In similar way we define the limits will be the same as $x \to -\infty$.

Thus, $y = \frac{2}{9}$ is a horizontal asymptote of $y = \frac{2x+3}{9x+1}$. Moreover, this function has a vertical asymptote

$x = -\frac{1}{9}$.

(x from −1.25 to 0.5)

$$\frac{2\,x+3}{9\,x+1}$$

$$\frac{2}{9}$$