

Find all asymptotes for the function $f(x) = \frac{-25x^2 + 20x - 3}{5x - 1}$.

1. Since the denominator is equal to 0 when $x = \frac{1}{5}$, the line $x = \frac{1}{5}$ is a vertical asymptote.

2. Note that $f(x) = \frac{-25x^2 + 20x - 3}{5x - 1} = \frac{(-25x^2 + 20x - 3)/x}{(5x - 1)/x} = \frac{-25x + 20 - \frac{3}{x}}{5 - \frac{1}{x}}$.

3. When x is a very large positive number or a very large negative number,

$f(x) = \frac{-25x^2 + 20x - 3}{5x - 1} = \frac{-25x + 20 - \frac{3}{x}}{5 - \frac{1}{x}}$ and is nearly equal to $\frac{-25x + 20}{5}$ or $-5x + 4$.

So the line $y = -5x + 4$ is an oblique asymptote.

4. There are no horizontal asymptotes.