$f(x) = \frac{x^2 - 2x + 1}{2x^2 + x - 1}$

$f(x)$ is even if $f(x) = f(-x)$
odd if $f(x) = -f(-x)$

Test for even or odd

$f(x) = \frac{x^2 - 2x + 1}{2x^2 + x - 1}$ $\quad f(-x) = \frac{x^2 + 2x + 1}{2x^2 - x - 1}$

$\therefore f(x)$ is neither even nor odd ✓

Factorise the expression to examine characteristics and find asymptotes

$f(x) = \frac{(x-1)^2}{(2x-1)(x+1)}$ ✓

$f(x) = 0$ when $x = 1$ ✓
and the lines $x = 1/2$ and $x = -1$ are vertical asymptotes ✓ ✓

$f'(x) = \frac{(2x^2 + x - 1)\frac{d}{dx}(x^2 - 2x + 1) - (x^2 - 2x + 1)\frac{d}{dx}(2x^2 - x - 1)}{(2x^2 - x - 1)^2}$

$= \frac{(2x^2 + x - 1)(2x - 2) - (x^2 - 2x + 1)(4x + 1)}{(2x^2 - x - 1)^2}$

$= \frac{4x^3 + 2x^2 - 2x - 4x^2 - 2x + 2 - 4x^3 + 8x^2 + 4x - x^2 + 2x - 1}{(2x^2 - x - 1)^2}$

$= \frac{5x^2 - 6x + 1}{(2x^2 + x - 1)^2}$ ✓

The values for which $f'(x) = 0$ are the roots of $5x^2 - 6x + 1$ ✓

$(5x - 1)(x - 1) = 0$

ie $x = 1/5$ or $x = 1$

$f(x)$, by examination has the following sign diagram (overleaf). ✓