a) D: $\{x \in \mathbb{R} \mid x \neq 0\}$, $(-\infty, 0) \cup (0, \infty)$

b) x-intercept(s):

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

$0 = x + \frac{1}{x^2}$

$x = -\frac{1}{x^2}$

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

$-1 = -1$

$\therefore$ x-intercept at $(-1, 0)$

y-intercept(s):

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

$f(0) = 0 + \frac{1}{0^2}$

= Undefined

$\therefore$ there are no y-intercepts

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

$= x + x^{-2}$

$f'(x) = 1 - 2x^{-3}$

$= -\frac{2}{x^3} + 1$

$f'(x) = -\frac{2}{x^3} + 1$

$= -2x^{-3} + 1$

$f''(x) = 6x^{-4}$

$= \frac{6}{x^4}$

d) $f'(x) = 1 - 2x^{-3}$

$0 = 1 - 2x^{-3}$

$-1 = -2x^{-3}$

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

$x = \sqrt[3]{2}$

$\therefore$ Minima at $x = \sqrt[3]{2}$

e) $f''(x) = 6x^{-4}$

$0 = 6x^{-4}$

No Solution

$\therefore$ No inflection points

Increasing: $x = -\infty$ to $x = 0$
and $x = \sqrt[3]{2}$ to $x = \infty$

Decreasing: $x = 0$ to $x = \sqrt[3]{2}$

f) $\lim_{x \to 0^-} f(x) = \infty$ $\lim_{x \to 0^+} f(x) = \infty$ $f(0) = 0 + \frac{1}{0^2}$ VAL @ $x = 0$

$= \text{Undefined}$

No HALs

$\lim_{x \to \infty} f(x) = x + \frac{1}{x^2} = 1x$ OAL @ $y = x$

g)