

# ***(G) Graphs of Reciprocal Functions***

The graph of  $y = \frac{1}{f(x)}$  can be sketched by first drawing  $y = f(x)$

and noticing;

- when  $f(x) = 0$ , then  $\frac{1}{f(x)}$  is undefined, (i.e. a vertical asymptote exists)
- when  $f(x) \rightarrow \infty$ , then  $\frac{1}{f(x)} \rightarrow 0$ , (i.e. asymptotes become  $x$  intercepts)
- when  $f(x)$  is increasing, the reciprocal is decreasing, and visa - versa
- when  $f(x)$  is positive,  $\frac{1}{f(x)}$  is positive, etc.
- the derivative of  $\frac{1}{f(x)}$  is  $\frac{-f'(x)}{[f(x)]^2}$ , hence stationary points of the original curve are stationary points of its reciprocal.

$$y = f(x)$$



