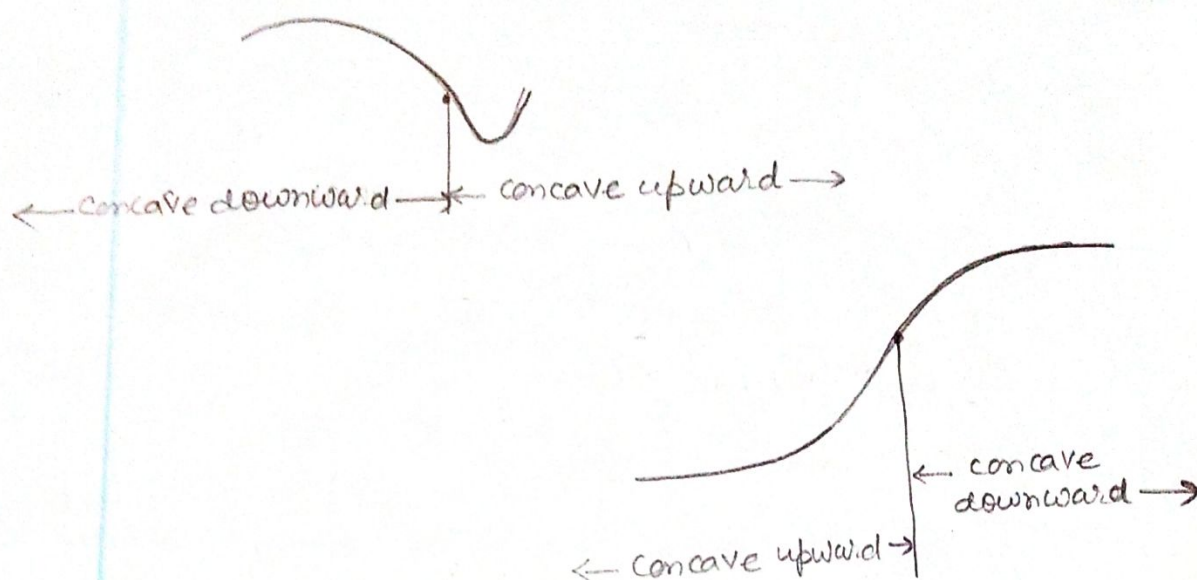


Assignment 6

1. An inflection point is where a curve changes from concave upward to concave downward or vice versa.



Therefore, it is not possible for a function to have a point of inflection at an extreme value as it is supposed to be in between of extremes.

2.

$f(x)$ has vertical asymptotes at $x = \pm \frac{1}{2}$ if the limits of the function at these points are infinite. $f(x)$ has horizontal asymptote at $y = 0$, if either

$$\lim_{x \rightarrow \infty} f(x) = 0 \text{ or } \lim_{x \rightarrow -\infty} f(x) = 0.$$

Thus, the rational function satisfying above conditions is

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

It is given that

$$f(0) = -3,$$

$$\text{Thus, } f(0) = \frac{0 + a}{-1/4} = -3$$

$$a = 3/4.$$

Thus.

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