

Extra  
Ex:

$$\int_3^4 \frac{1}{(x-3)(x-5)} dx = \int_3^4 \frac{-\frac{1}{2}}{x-3} + \frac{\frac{1}{2}}{x-5} dx$$

$$= \lim_{R \rightarrow 3^+} \left( \frac{1}{2} \ln|x-3| \Big|_R^4 \right) + \frac{1}{2} \ln|x-5| \Big|_3^4$$

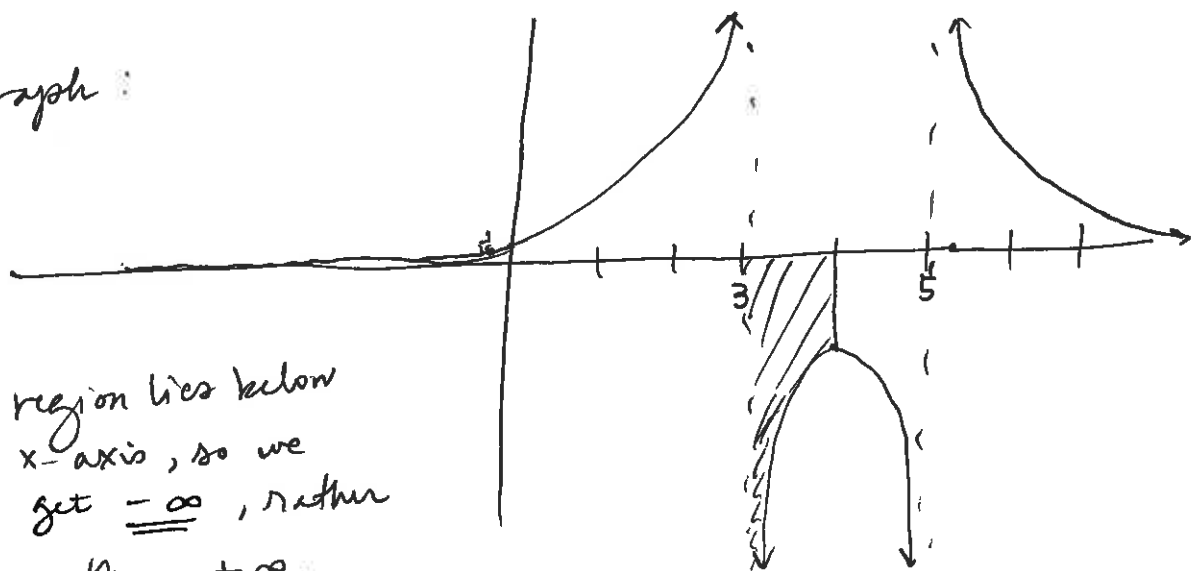
$$= -\frac{1}{2} \lim_{R \rightarrow 3^+} \left( \ln|1| - \ln|R-3| \right) + \frac{1}{2} \ln|-1| - \frac{1}{2} \ln|-2|$$

$$= \frac{1}{2} \lim_{R \rightarrow 3^+} \left( \ln|R-3| \right) - \frac{1}{2} \ln|2|.$$

$$= \underline{\underline{-\infty}} \quad \text{This improper integral diverges.$$

(this problem is more typical of the level of problem you'll be asked to do)

Graph:



region lies below  
x-axis, so we  
get  $-\infty$ , rather  
than  $+\infty$ .