

1. Calculate $\lim_{x \rightarrow 0} \left(\frac{1}{x} - \frac{1}{\sin x} \right)$.

(Total 6 marks)

2. Find

(a) $\lim_{x \rightarrow 0} \frac{\tan x}{x + x^2}$;

(4)

(b) $\lim_{x \rightarrow 1} \frac{1 - x^2 + 2x^2 \ln x}{1 - \sin \frac{\pi x}{2}}$.

(7)

(Total 11 marks)