

SATPREP
Assignment - Limits

1. Evaluate each of the following :

$$(a) \lim_{x \rightarrow 0} \frac{e^{2x} - 1}{x} \quad (b) \lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

2. Find the value of each of the following :

$$(a) \lim_{x \rightarrow 1} \frac{e^{-x} - e^{-1}}{x - 1} \quad (b) \lim_{x \rightarrow 1} \frac{e - e^x}{x - 1}$$

3. Evaluate the following :

$$(a) \lim_{x \rightarrow 0} \frac{\sin 4x}{2x} \quad (b) \lim_{x \rightarrow 0} \frac{\sin x^2}{5x^2} \quad (c) \lim_{x \rightarrow 0} \frac{\sin x^2}{x}$$
$$(d) \lim_{x \rightarrow 0} \frac{\sin ax}{\sin bx}$$

4. Evaluate each of the following :

$$(a) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} \quad (b) \lim_{x \rightarrow 0} \frac{1 - \cos 8x}{x} \quad (c) \lim_{x \rightarrow 0} \frac{\sin 2x(1 - \cos 2x)}{x^3}$$
$$(d) \lim_{x \rightarrow 0} \frac{1 - \cos 2x}{3 \tan^2 x}$$

5. Find the values of the following :

$$(a) \lim_{x \rightarrow 0} \frac{1 - \cos ax}{1 - \cos bx} \quad (b) \lim_{x \rightarrow 0} \frac{x^3 \cot x}{1 - \cos x} \quad (c) \lim_{x \rightarrow 0} \frac{\operatorname{cosec} x - \cot x}{x}$$

6. Evaluate each of the following :

$$(a) \lim_{x \rightarrow \pi} \frac{\sin x}{\pi - x} \quad (b) \lim_{x \rightarrow 1} \frac{\cos \frac{\pi}{2} x}{1 - x} \quad (c) \lim_{x \rightarrow \frac{\pi}{2}} (\sec x - \tan x)$$

7. Evaluate the following :

$$(a) \lim_{x \rightarrow 0} \frac{\sin 5x}{\tan 3x} \quad (b) \lim_{\theta \rightarrow 0} \frac{\tan 7\theta}{\sin 4\theta} \quad (c) \lim_{x \rightarrow 0} \frac{\sin 2x + \tan 3x}{4x - \tan 5x}$$