Basic Calculus | 4th Quarter

Mini Task 0: Limits of Trigonometric Functions

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Group 5 Members:
Badron, Ilagan, Leaño, Magcalas, Mendoza, Motas, Renolayan

1. $\lim_{x\to 0} \frac{\sin x}{5x}$

   $\frac{\sin x}{x}\cdot\frac{1}{5}$

   $1\cdot\frac{1}{5}$

   $\lim_{x\to 0} \frac{\sin x}{5x}=\frac{1}{5}$

2. $\lim_{x\to 0} \frac{3(1-\cos x)}{x}$

   $\frac{3}{1}\cdot\frac{1-\cos x}{x}$

   $3\cdot 0$

   $\lim_{x\to 0} \frac{3(1-\cos x)}{x}=0$

3. $\lim_{x\to 0} \frac{\sin x(1-\cos x)}{x^2}$

   $\frac{\sin x}{x}\cdot\frac{1-\cos x}{x}$

   $1\cdot 0$

   $\lim_{x\to 0} \frac{\sin x(1-\cos x)}{x^2}=0$

4. $\lim_{\theta\to 0} \frac{\cos\theta\tan\theta}{\theta}$

   $\tan\theta=\frac{\sin\theta}{\cos\theta}$

   $\sin\theta=\cos\theta\tan\theta$

   $\frac{\sin\theta}{\theta}=1$

   $\lim_{\theta\to 0} \frac{\cos\theta\tan\theta}{\theta}=1$

5. $\lim_{x\to 0} \frac{\sin^2 x}{x}$

   $\frac{\sin x}{1}\cdot\frac{\sin x}{x}$

   $\sin x\cdot 1$

   $\sin 0\cdot 1$

   $0\cdot 1$

   $\lim_{x\to 0} \frac{\sin^2 x}{x}=0$