

Trigonometry : Small Angles

1) Find

a) $\lim_{\theta \rightarrow 0} \left(\frac{\sin 3\theta + \tan 5\theta}{2\theta} \right)$

b) $\lim_{\theta \rightarrow 0} \left(\frac{\cos 2\theta - 1}{\theta \sin 5\theta} \right)$

c) $\lim_{\theta \rightarrow 0} \left(\frac{\sin 2\theta}{\theta} \right)$

2) for small angles of θ what do the following approximate to? Do not ignore θ^2 .

a) $\frac{\cos \theta - 1}{\sin \theta}$

b) $\frac{\sin \theta}{1 - \cos 2\theta}$

c) $\frac{21 + 7\tan \theta - 20\cos \theta}{1 + \sin 2\theta}$

d) $\frac{1 + \sin \theta}{5 + 3\tan \theta - 4\cos \theta}$

3) Solve these equations for small angles of x which are positive (approximate answers)

a) $\cos x - 4 \sin x = x^2$

b) $\frac{21 + 7\tan x - 20\cos x}{1 + \sin 2x} = 2$