Math 1210 #5
5 Limits of Trig Functions

Theorem

For every c in the in the trigonometric function's domain,

$$\lim_{x\to c}\sin\ x = \sin\ c \qquad \lim_{x\to c}\csc\ x = \csc\ c$$
$$\lim_{x\to c}\cos\ x = \cos\ c \qquad \lim_{x\to c}\sec\ x = \sec\ c$$
$$\lim_{x\to c}\tan\ x = \tan\ c \qquad \lim_{x\to c}\cot\ x = \cot\ c$$

Special Trigonometric Limit Theorems

$\lim_{t\to 0}\frac{\sin\ t}{t} = 1$

$\lim_{t\to 0}\frac{1-\cos\ t}{t} = 0$

EX 1

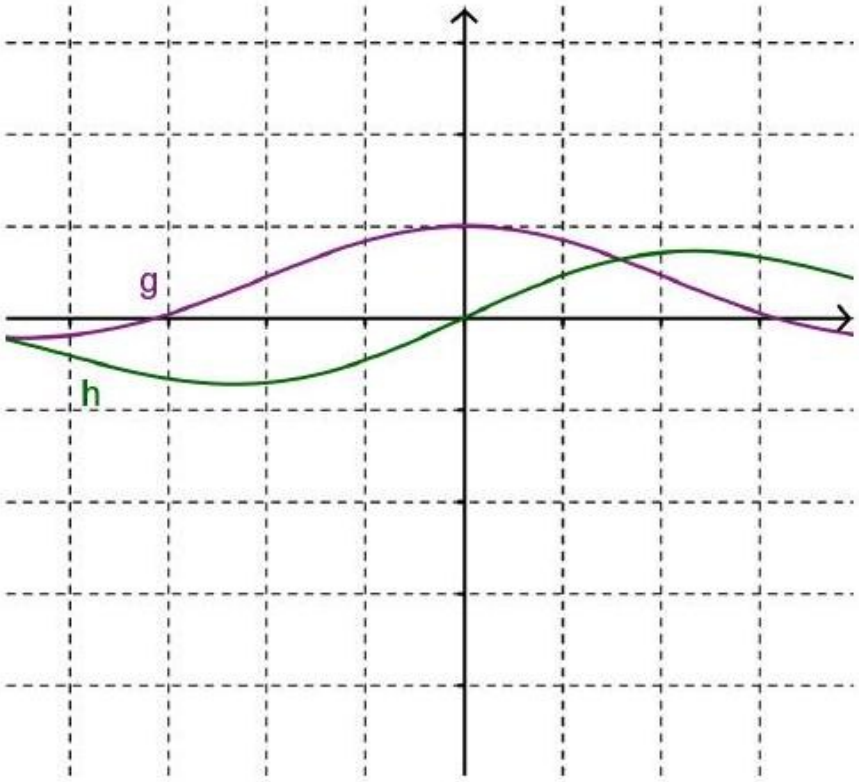
$$\lim_{x \to 0} \frac{3x\tan x}{\sin x}$$

EX 2

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

EX 3

$$\lim_{\theta \to 0} \frac{\tan(5\theta)}{\sin(2\theta)}$$



$$g(t) = \frac{\sin t}{t}$$

$$h(t) = \frac{1-\cos t}{t}$$