Math 16A
Kouba

Supplemental Trig Problems

ST1.) Determine the indicated limit.

a.) $\lim_{x \to 0^+} \frac{4\cos x + 5}{3\sin x + 2}$

b.) $\lim_{x \to 0^+} \frac{3}{1 - \cos x}$

c.) $\lim_{x \to \frac{\pi}{2}^-} \tan x$

d.) $\lim_{x \to \frac{\pi}{2}^+} \tan x$

e.) $\lim_{x \to 0} \frac{\sin 2x}{\sin x}$

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

ST2.) Show that $y = \tan x$ is an increasing function for $-\frac{\pi}{2} < x < \frac{\pi}{2}$.

ST3.) Find all relative and absolute extrema for

a.) $f(x) = \sqrt{3}\sin x + \cos x$ on $[0, 2\pi]$

b.) $f(x) = \sin^2 x$ on $[0, 4\pi]$

ST4.) Find an equation of the line tangent to the graph of $x^3 + \sin y = y^2 + 7x$ at the point $(0,0)$.

ST5.) Find the slope of the line perpendicular to the graph of $(x + \tan y)^2 = 8 + \sin(xy)$ at the point $(2, \frac{\pi}{4})$.

ST6.) Differentiate $y = \sin^3(\tan^2(3x))$.