4.5/(32) $y = \sin x - \tan x$.

domain/intercepts/symmetry/asymptotes/incr-decr/ max-min/concavity-inflec / sketch.

(A.) $D = \{ x \mid x \neq \pm \pi/2, \pm 3\pi/2, \pm 5\pi/2, \dots \}$.

(C) $f(-x) = \sin(-x) - \dfrac{\sin(-x)}{\cos(-x)} = -\sin x + \dfrac{\sin x}{\cos x} =$

$= -\sin x + \tan x = -f(x) \Rightarrow f(x)$ odd.

$f(x + 2\pi) = f(x)$: $f(x)$ has period 2π.

(B) $x = 0 \to y = 0 - \dfrac{0}{1} = 0$: y-int. pt is $(0,0)$

$y = 0$ if $\sin x = \tan x \Rightarrow \sin x = \dfrac{\sin x}{\cos x}$.

only true at $x = n\pi$, $n = 0, 1, 2, \dots$

x-int pts $(n\pi, 0)$, $n = 0, 1, 2, \dots$

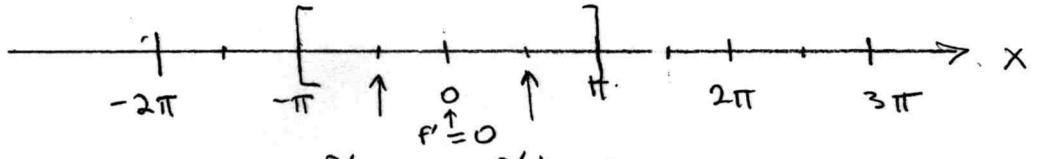
(D) vertical asymptotes when $\cos x = 0$ or $x = \pm\dfrac{\pi}{2}, \pm\dfrac{3\pi}{2}, \pm\dfrac{5\pi}{2}, \dots$ no horiz asy.

(E) $f'(x) = \cos x - \sec^2 x = \cos x - \dfrac{1}{\cos^2 x} = 0$ if

$\cos x = \dfrac{1}{\cos^2 x}$ or $\cos^3 x = 1$. $\Leftrightarrow \cos x = 1$.

$\Leftrightarrow x = 0, \pm 2\pi, \pm 4\pi, \dots$

$f'(x)$ d.n.e. if $x = \pm \pi/2, \pm 3\pi/2, \pm 5\pi/2, \dots$.



$f'(-\frac{3\pi}{4}) \approx -2.7$ $\quad f'(\pi/4) = -1.3$

$f'(-\frac{\pi}{4}) \approx -1.3$ $\quad f'(3\pi/4) = -2.7$

} checked one period.

The fnc is decreasing (not increasing) on its domain.