Opener 9/27/1 Super Product Rule problem

$\frac{d}{dx}$ f(x)g(x)h(x) = f'(x)g(x)h(x) + g'(x)f(x)h(x) + h'(x)f(x)g(x)

If $f(x) = e^x$ $g(x) = \sin x$ $h(x) = 7x^3 - 6x + 19$

find $\frac{d}{dx}$f(x)g(x)h(x).

2.5

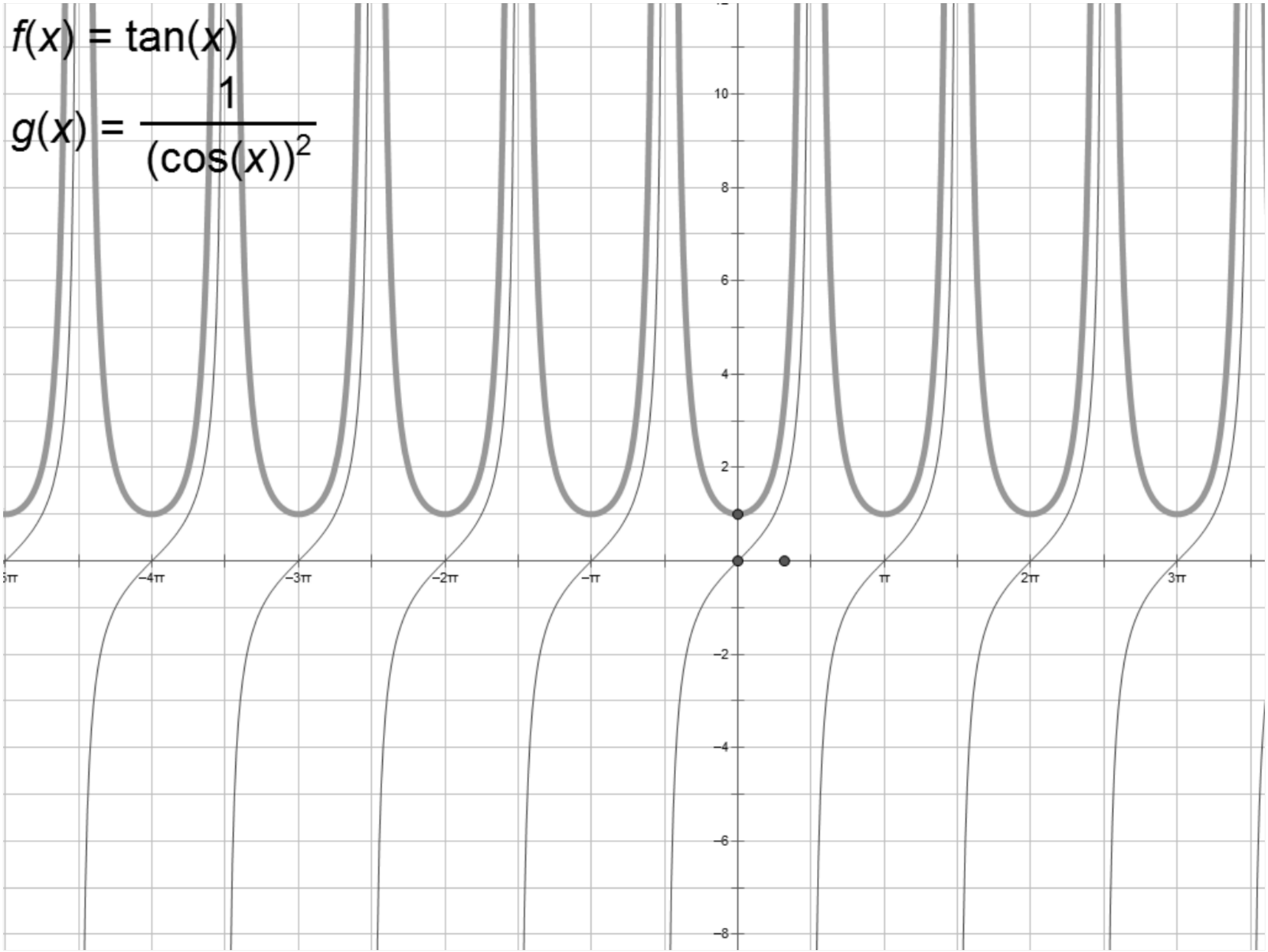
Derivatives of Trigonometric Functions

Derivatives of trig functions

$$\frac{d}{dx}\left(\sin x\right) = \cos x \qquad \frac{d}{dx}\left(\csc x\right) = -\csc x \cot x$$

$$\frac{d}{dx}\left(\cos x\right) = -\sin x \qquad \frac{d}{dx}\left(\sec x\right) = \sec x \tan x$$

$$\frac{d}{dx}\left(\tan x\right) = \sec^2 x \qquad \frac{d}{dx}\left(\cot x\right) = -\csc^2 x$$


f(x) = tan(x)
g(x) = 1 / (cos(x))^2
10
8
6
4
2
−2
−4
−6
−8
−4π
−3π
−2π
−π
π
2π
3π

Homework hints:

Often times answers are simplified using trig identities - be cool with those (ex. $\sec^2 = \tan^2 + 1$ for # 31).
Any trig identity you need to know is on the back of the first reference page of your textbook.

For #15, think of today's opener

Do NOT use a calculator for #35. In fact, unless you're checking derivative graphs (like for #28b), you shouldn't need a calculator for any of the problems.

Derivatives of trig functions

$$\frac{d}{dx}\left(\sin x\right) = \cos x \qquad \frac{d}{dx}\left(\csc x\right) = -\csc x \cot x$$

$$\frac{d}{dx}\left(\cos x\right) = -\sin x \qquad \frac{d}{dx}\left(\sec x\right) = \sec x \tan x$$

$$\frac{d}{dx}\left(\tan x\right) = \sec^2 x \qquad \frac{d}{dx}\left(\cot x\right) = -\csc^2 x$$