

*** IMPORTANT ***

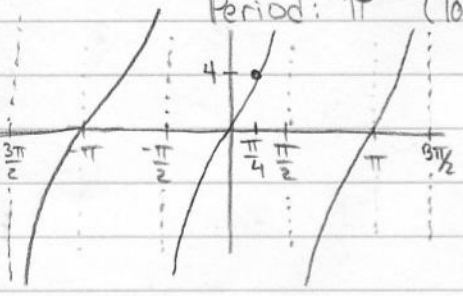
You will be expected to do these types of problems without a calculator on the exam

5.4

1-46. Find the period and graph the function.

1. $y = 4 \tan x$

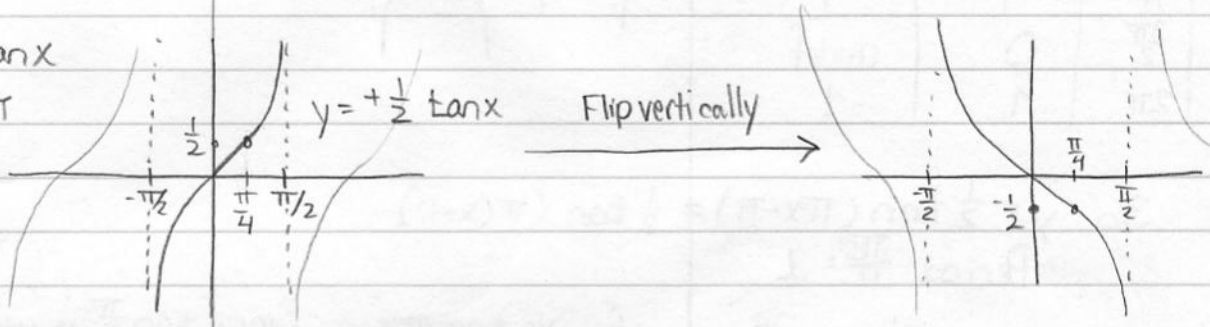
Period: π (Tangent has period π)



Stretch the tangent graph vertically by 4
(Yes, it's hard to tell, that's why I marked $(\frac{\pi}{4}, 4)$)

3. $y = -\frac{1}{2} \tan x$

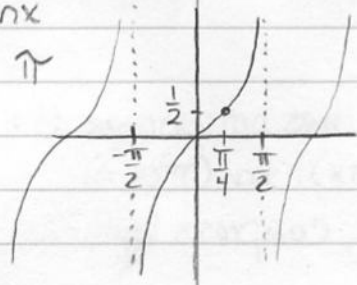
Period: π



Tip: Since $\tan(\frac{\pi}{4}) = 1$, the graph of $y = A \tan x$ will pass through the point $(\frac{\pi}{4}, A)$, so mark that point.

4. $y = \frac{1}{2} \tan x$

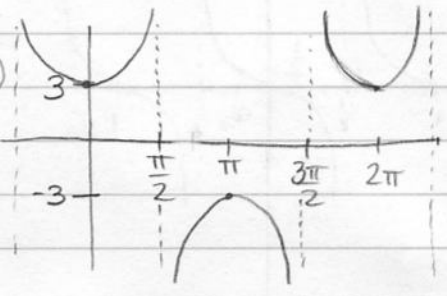
Period: π



9. $y = 3 \sec x$

Period: 2π (sec has period 2π)

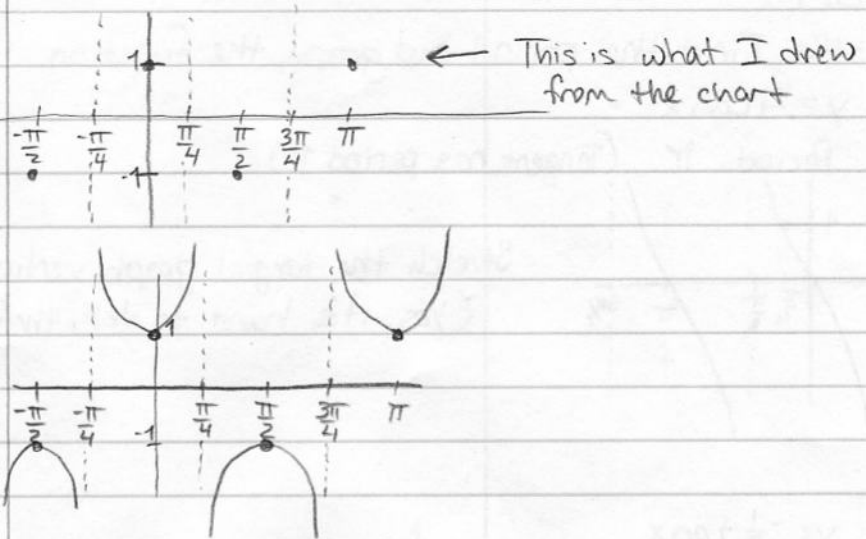
Remember $\sec x = \frac{1}{\cos x}$, so
 $\sec x = 1$ when $\cos x = 1$ (ie. $x = 0, 2\pi, \dots$)
 and $\sec x$ is undefined when
 $\cos x = 0$ (ie. $x = \frac{\pi}{2}, \frac{3\pi}{2}, \dots$).



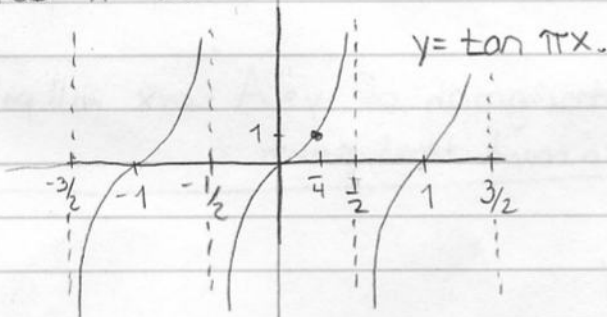
23. $y = \sec 2x$
 Period: $\frac{2\pi}{2} = \pi$

Check:

x	2x	cos 2x	sec 2x
$-\frac{\pi}{2}$	$-\pi$	-1	-1
$-\frac{\pi}{4}$	$-\frac{\pi}{2}$	0	undef
0	0	1	1
$\frac{\pi}{4}$	$\frac{\pi}{2}$	0	undef
$\frac{\pi}{2}$	π	-1	-1
$\frac{3\pi}{4}$	$\frac{3\pi}{2}$	0	undef
π	2π	1	1



36. $y = \frac{1}{2} \tan(\pi x - \pi) = \frac{1}{2} \tan(\pi(x-1))$
 Period: $\frac{\pi}{\pi} = 1$



Since $\tan \frac{\pi}{2}$ is undefined, we see that $y = \tan \pi x$ is undefined at $x = \frac{1}{2}$.

Shifting everything to the right 1 does not change the picture, since $\tan(\pi x)$ has period 1. Thus $\tan(\pi x) = \tan(\pi(x-1))$.

Now we just need to vertically compress by $\frac{1}{2}$.

