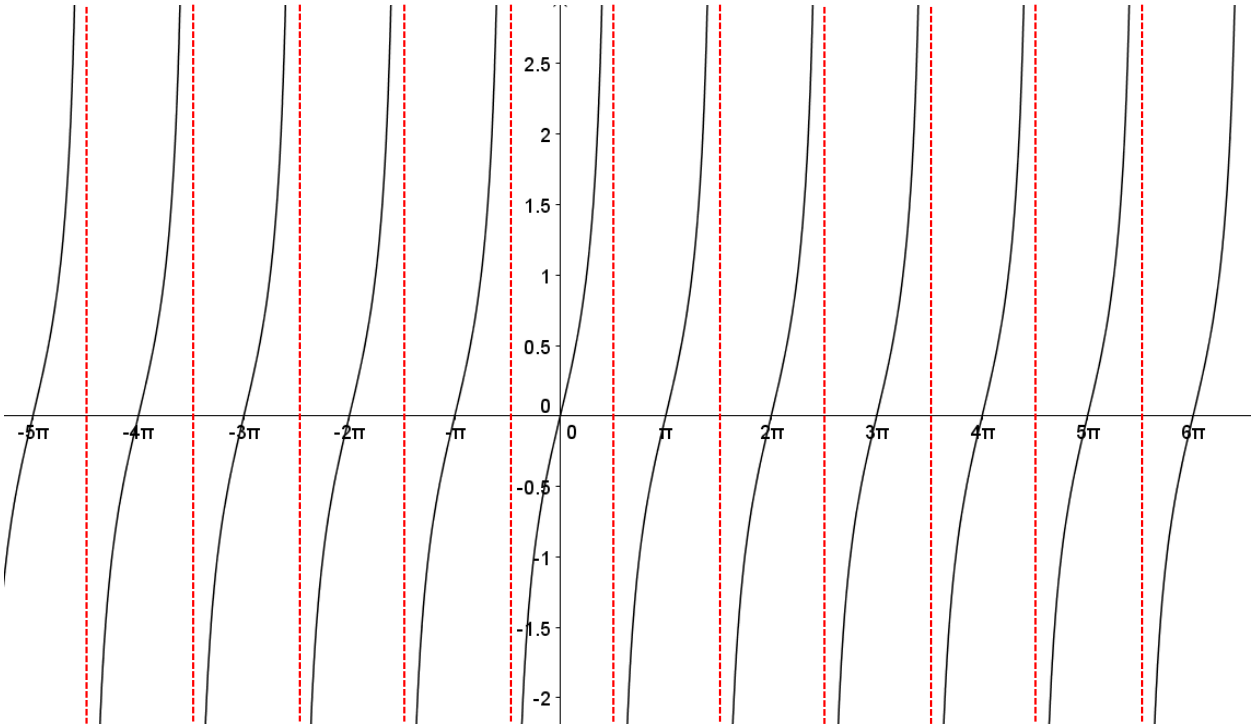
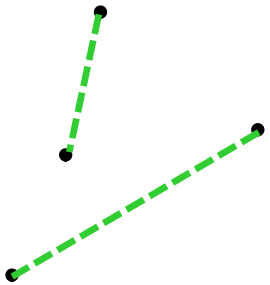
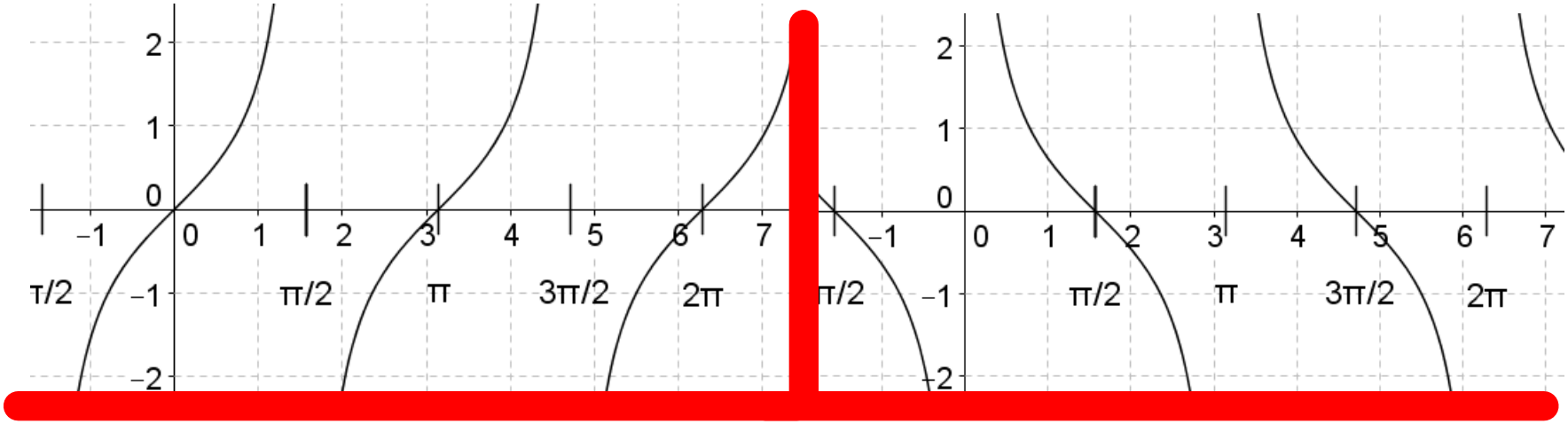
Know table of properties for six functions
Draw sin, cos for a transformed function with any combination of constants.
Write functions from pictures for sin, cos
- Which ever you are told, or both.
- Any combination of constants

Draw tan, cot, sec, and csc with one or two tranformations (never both horizontals)



Domain
Range
Odd or Even?
Period?
X intercepts?
Y intercepts?
Vertical
asymptotes?

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1
0
−1
−2
−1
0
1
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3
4
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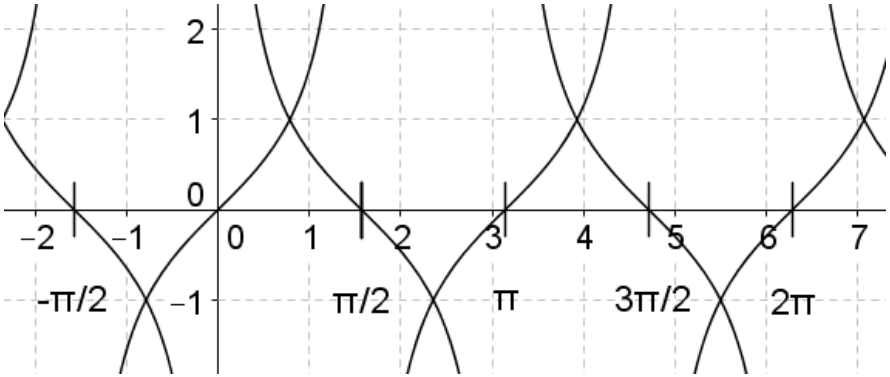
7
π/2
π
3π/2
2π
π/2
π
3π/2
2π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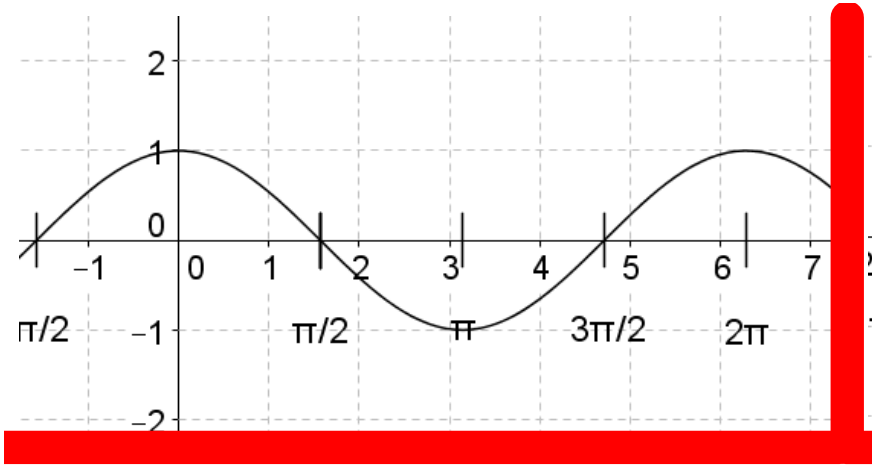
π/2
π
3π/2
2π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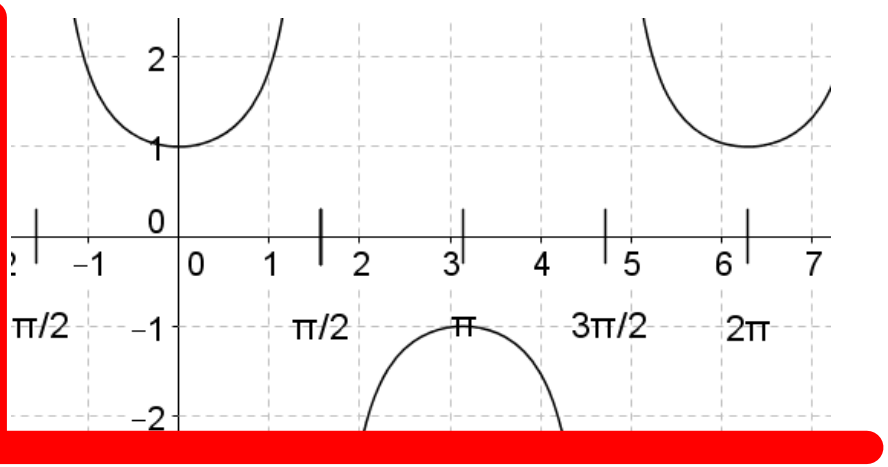
3π/2
2π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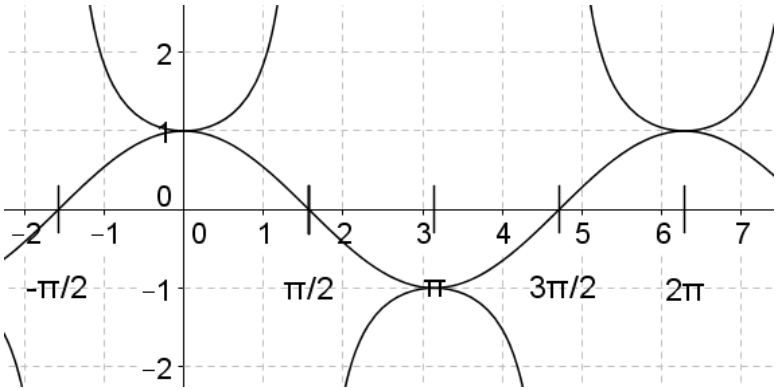
2π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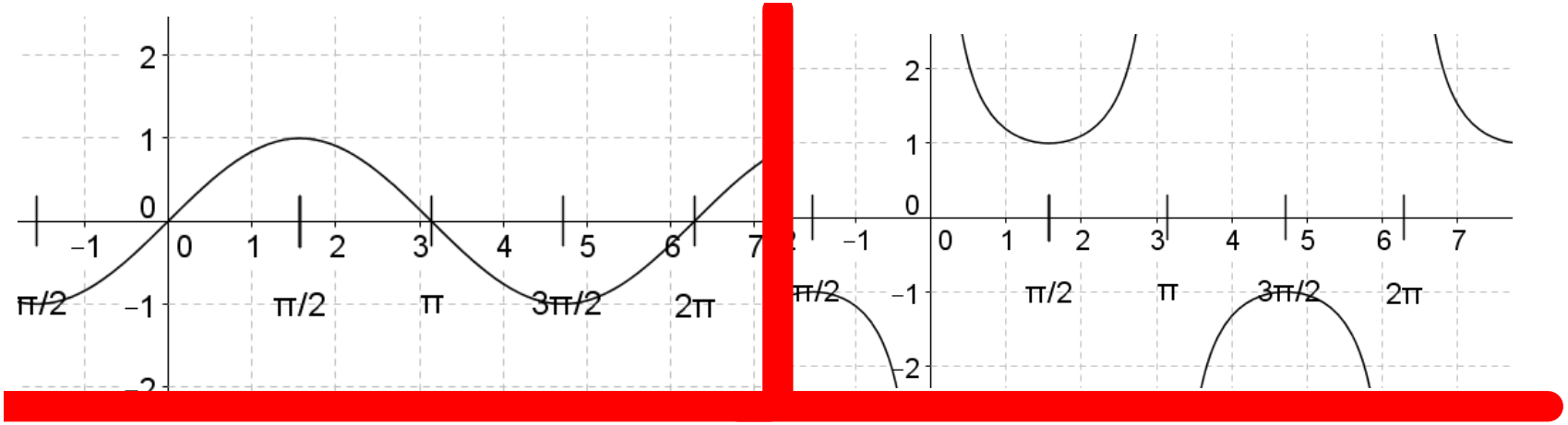
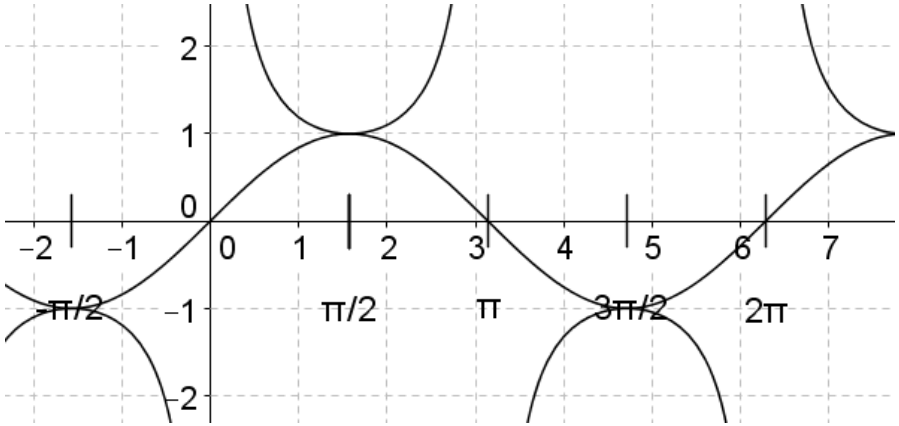
6
7
-π/2
π/2
π
3π/2
2π


2
1
0
−1
−2
−1 0 1 2 3 4 5 6 7
π/2 π π/2 π 3π/2 2π
−1 0 1 2 3 4 5 6 7
π/2 π 3π/2 2π


2
1
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−1
−2
−2 −1 0 1 2 3 4 5 6 7
π/2 π/2 π 3π/2 2π

Properties of the Tangent Function

1. The domain is the set of all real numbers, except odd multiples of $\frac{\pi}{2}$.
2. The range consists of all real numbers.
3. The tangent function is an odd function, as the symmetry of the graph with respect to the origin indicates.
4. The tangent function is periodic, with period π.
5. The x-intercepts are $\ldots, -2\pi, -\pi, 0, \pi, 2\pi, 3\pi, \ldots$; the y-intercept is 0.
6. Vertical asymptotes occur at $x = \ldots, -\frac{3\pi}{2}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}, \ldots$.

Showing a tranformation of tan,cotan,csc,sec.

$$y = A\tan(\omega x + \phi) + B$$

$$y = A\sin(\omega\left(x + \frac{\phi}{\omega} \right)) + B$$

4tan(2x)

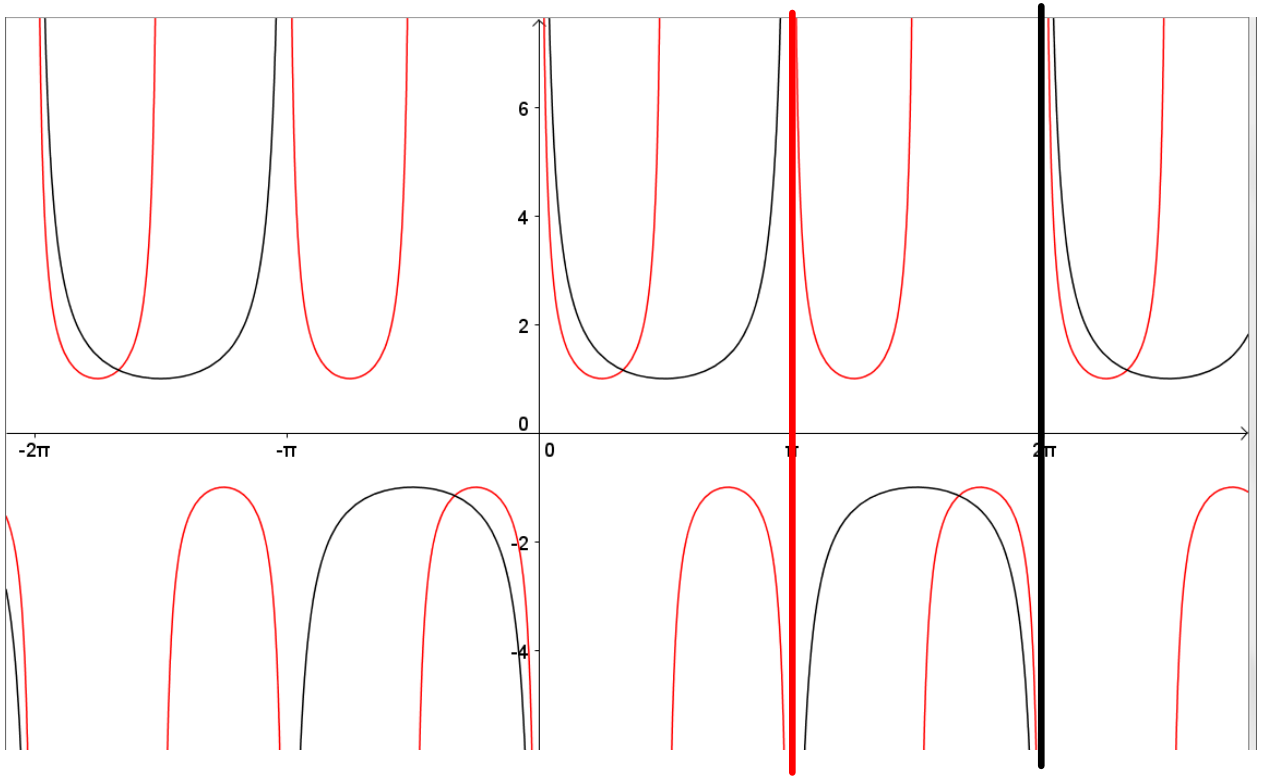
Show the 2 by:

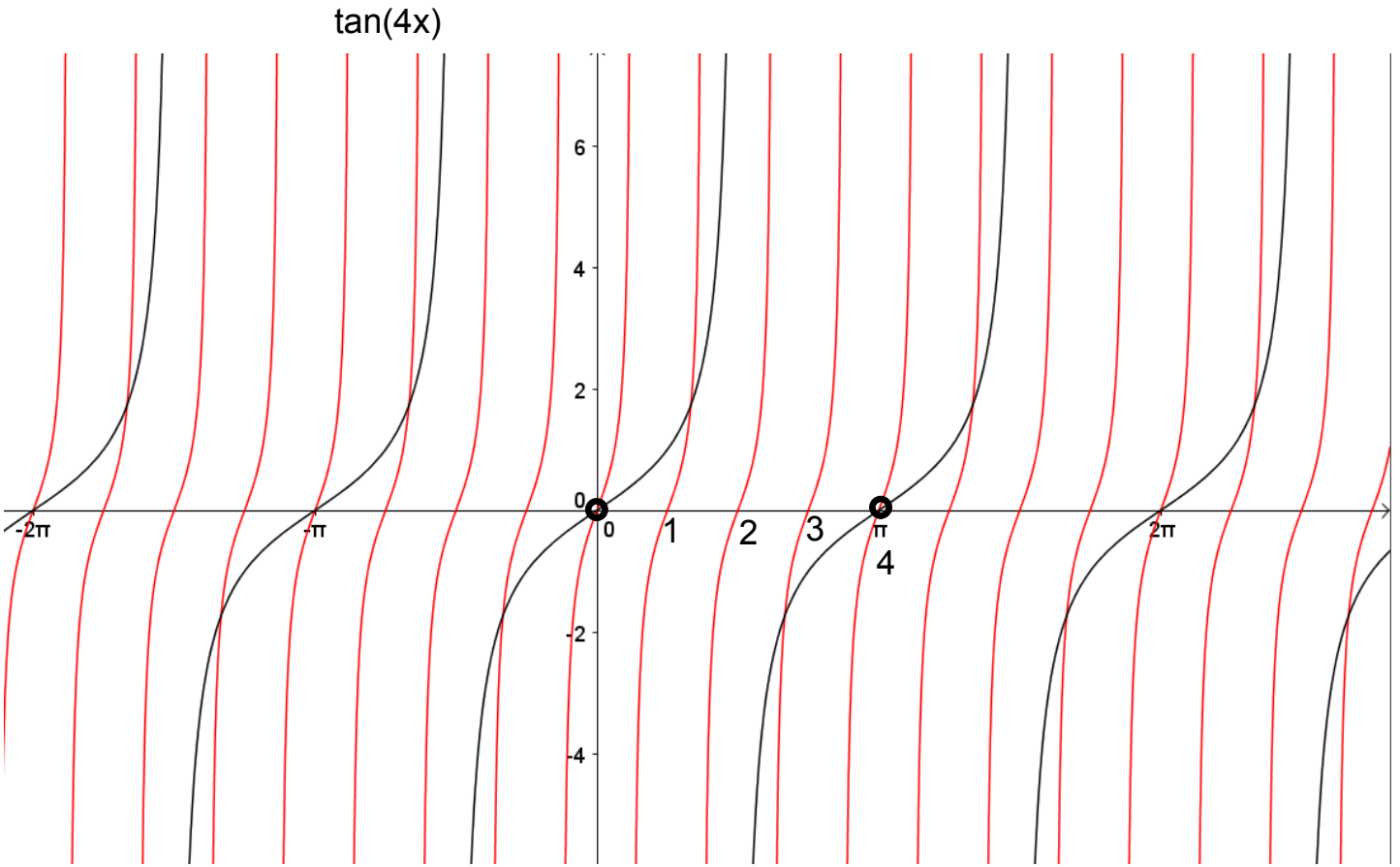
- figuring out the new period $\frac{base\ period}{\omega} = new\ period = \frac{\pi}{2}$
- plot new x intercepts and asymptotes.
  - Asymptotes were every $(\pi/2)+\pi x$ Now: $(\pi/4)+(\pi/2)*x$
  - X intercepts were πx now $(\pi/2)x$

Show the 4 by taking the point $(\pi/4,1)$ and making it $(\pi/8,4)$

$(\pi/4,1)$=>($(\pi/4)/2$,1*4)=>$(\pi/8,4)$

csc(2x)





$\omega = \pi/p$