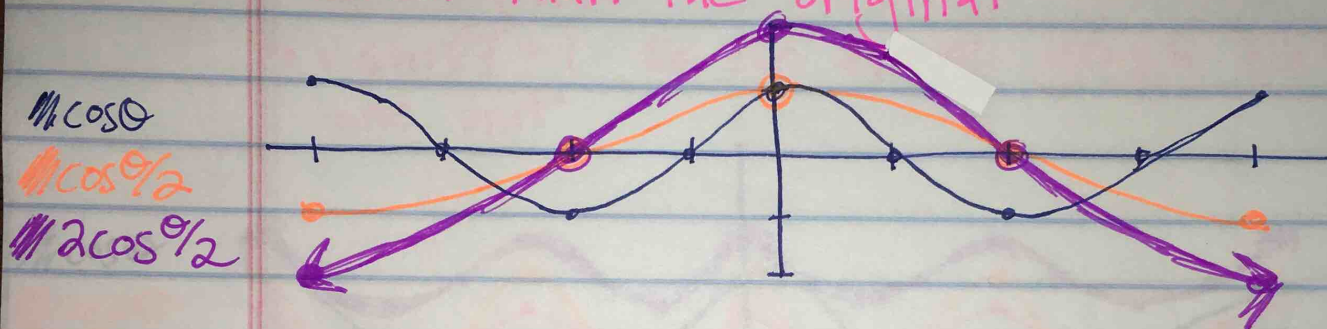


HM3 - Graphing Sin, Cos, & Tan Continued

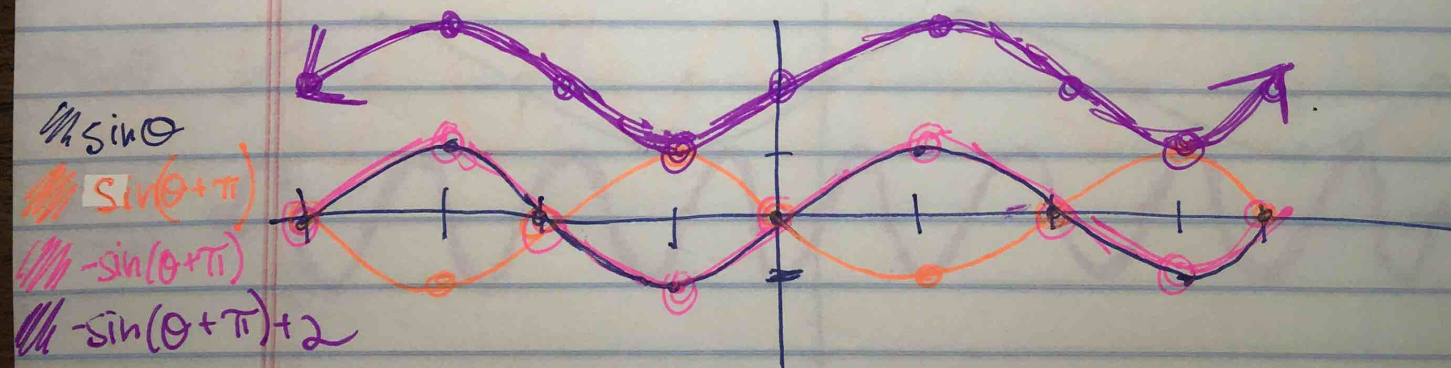
① $y = 2\cos \frac{\theta}{2}$

- amp = 2 so twice as tall as original function
- period = $2\pi / \frac{1}{2} = 4\pi$ so it repeats two times slower than the original



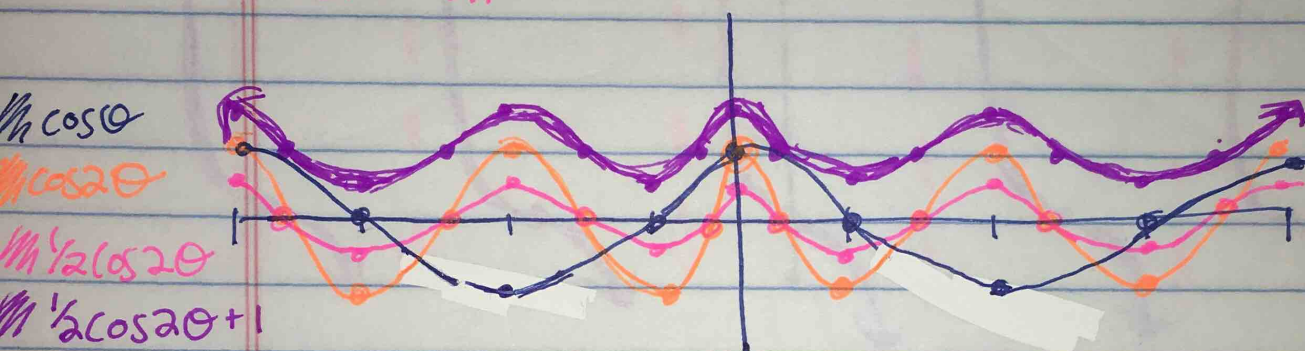
② $y = -\sin(\theta + \pi) + 2$

- negative flips it over the middle
- p. shift = $-\pi$ so entire graph moves left π units (2 tick marks)
- v. shift = 2 so entire graph shifts up 2 units



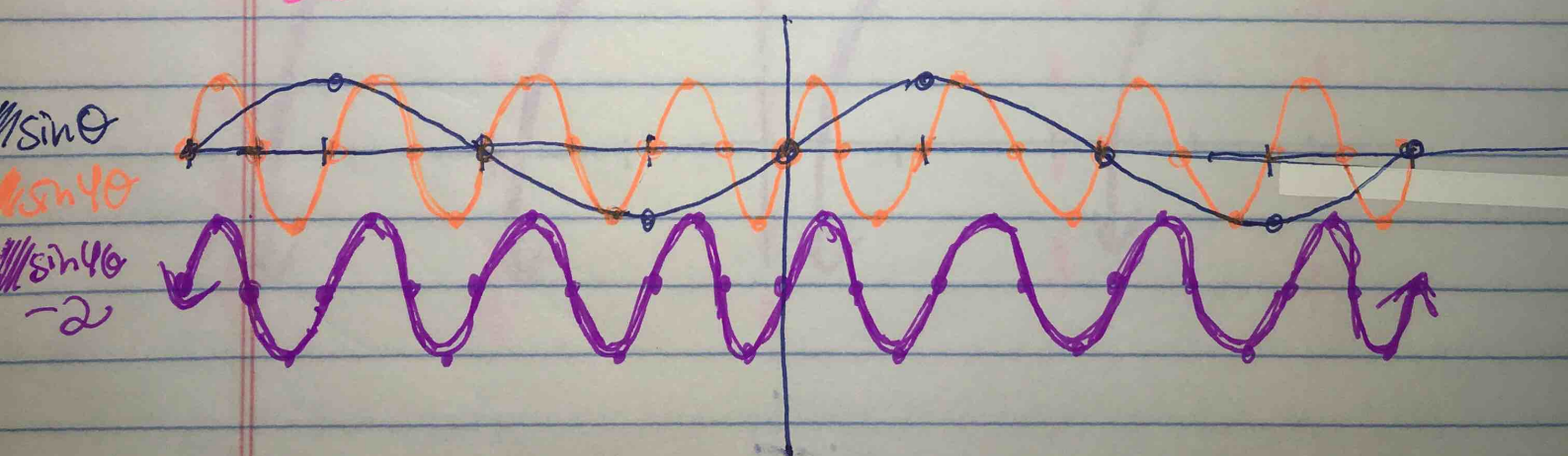
③ $y = \frac{1}{2} \cos(2\theta) + 1$

- amp = $\frac{1}{2}$ so $\frac{1}{2}$ as tall as original
- period = $\frac{2\pi}{2} = \pi$ so it repeats twice as fast as original
- v. shift = $+1$ so the entire graph shifts up one unit



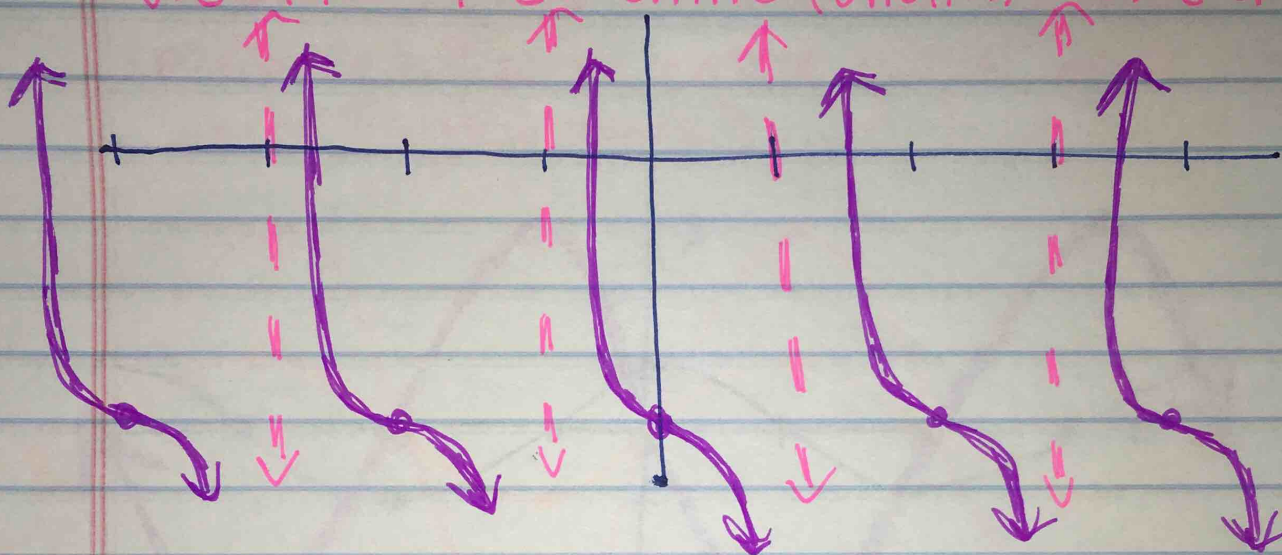
④ $y = \sin(4\theta) - 2$

- period = $\frac{2\pi}{4} = \frac{\pi}{2}$ so it repeats 4 times faster than the original
- v. shift = -2 so the entire graph shifts down 2



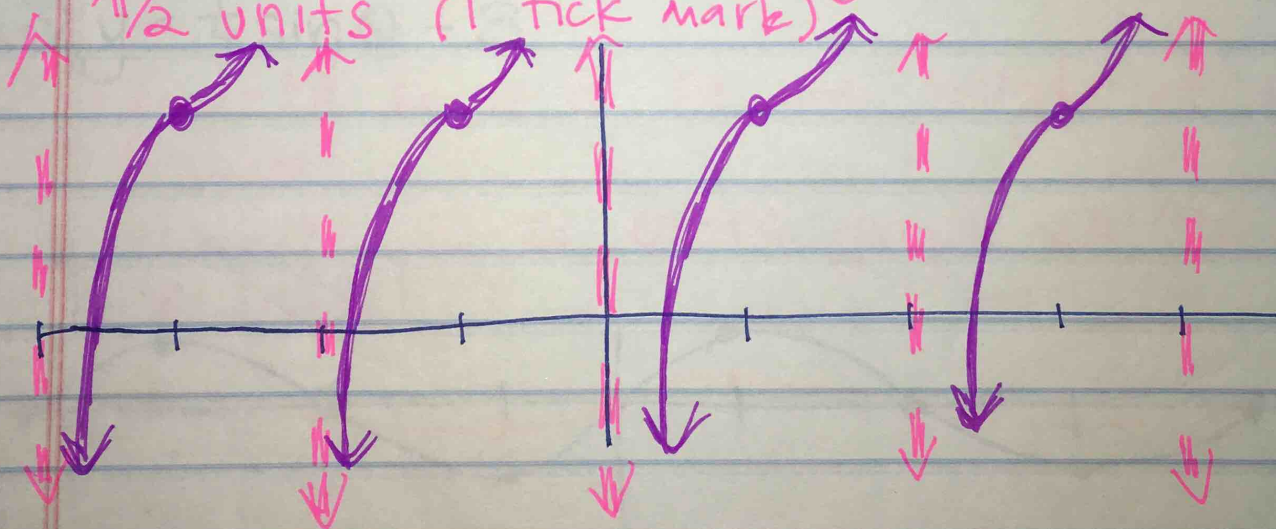
⑤ $y = -\tan \theta - 4$

- negative flips the function over the middle
- v. shift $= -4$ so entire function moves down 4



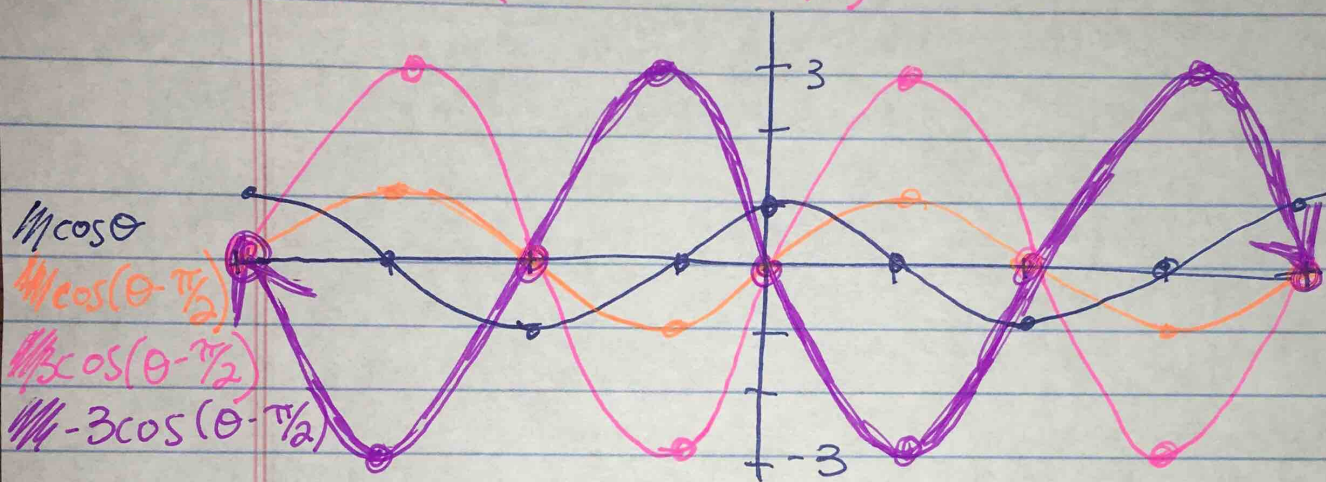
⑥ $y = \tan(\theta + \pi/2) + 3$

- p. shift $= -\pi/2$ so entire graph shifts left $\pi/2$ units (1 tick mark)



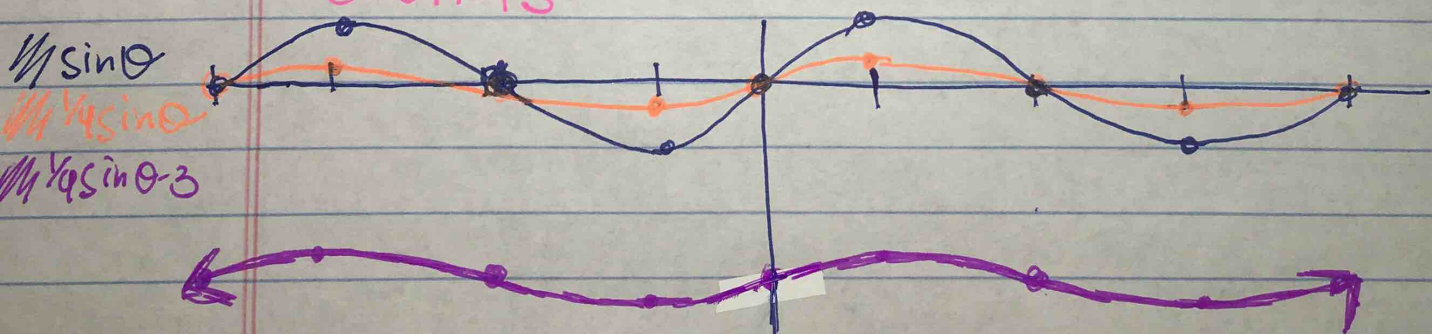
⑦ $y = -3\cos(\theta - \pi/2)$

- amp = 3 so 3 times as tall as original
- negative flips it over the middle
- p. shift = $\pi/2$ so entire graph moves right $\pi/2$ units (1 tick mark)



⑧ $y = \frac{1}{4}\sin \theta - 3$

- amp = $1/4$ so it is $1/4$ the height of original function
- v. shift = -3 so entire graph shifts down 3 units



⑨ $y = 4\cos 4\theta - 2$

⑩ $y = 3\sin \theta$

⑪ $y = \frac{1}{2}\sin \theta - 1$

⑫ $y = \sin \theta/2$

⑬ $y = 2\cos \theta - 3$

⑭ $y = -3\sin \theta$