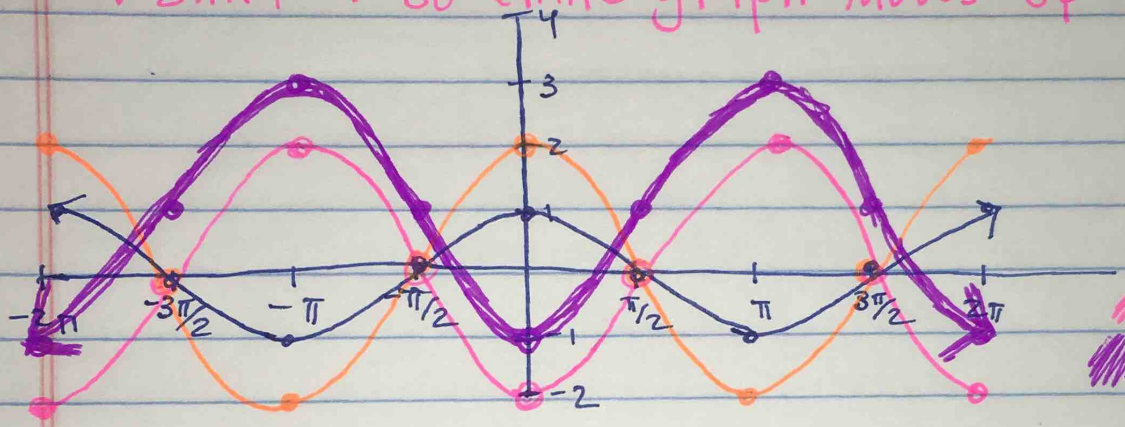
HW3 - Graphing Sine, Cosine, and Tangent

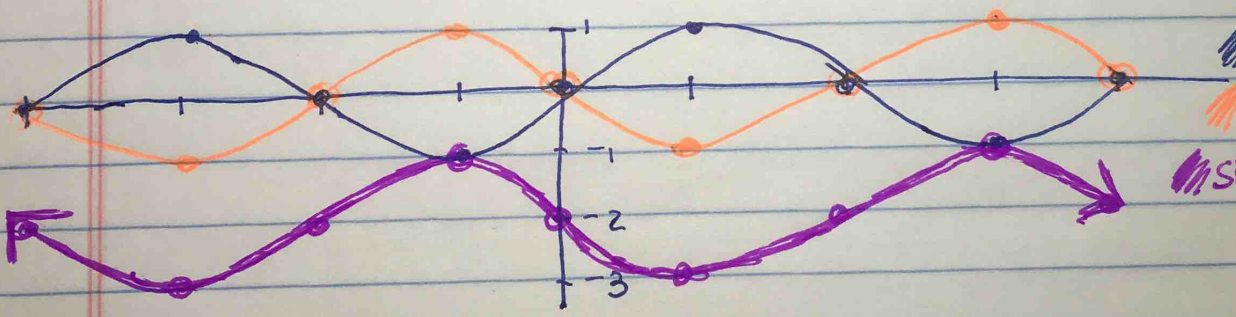
① $y = -2\cos\theta + 1$

- amp = 2 so its twice as tall as original
- the negative flips it over the middle
- v. shift = 1 so entire graph moves up 1 unit



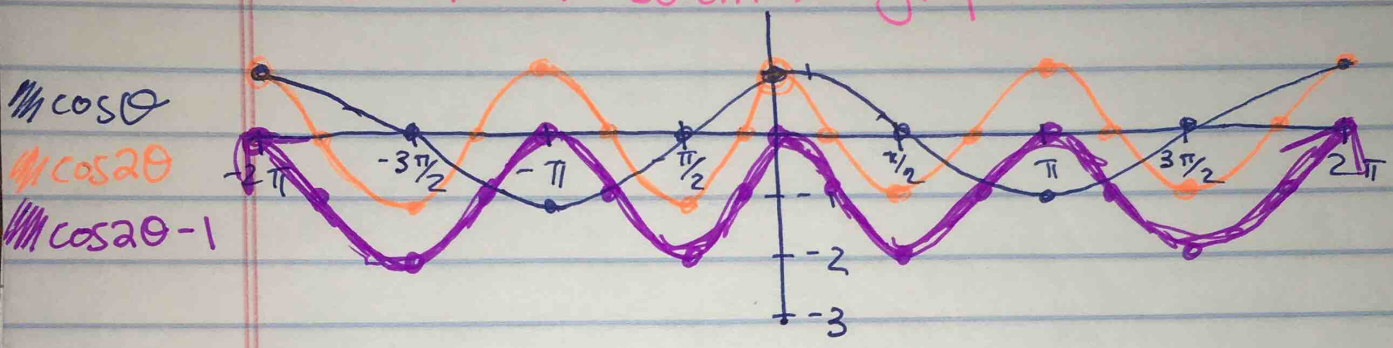
② $y = \sin(\theta - \pi) - 2$

- p. shift = π so entire graph shifts right π units (2 tick marks)
- v. shift = -2 so entire graph shifts down 2 units



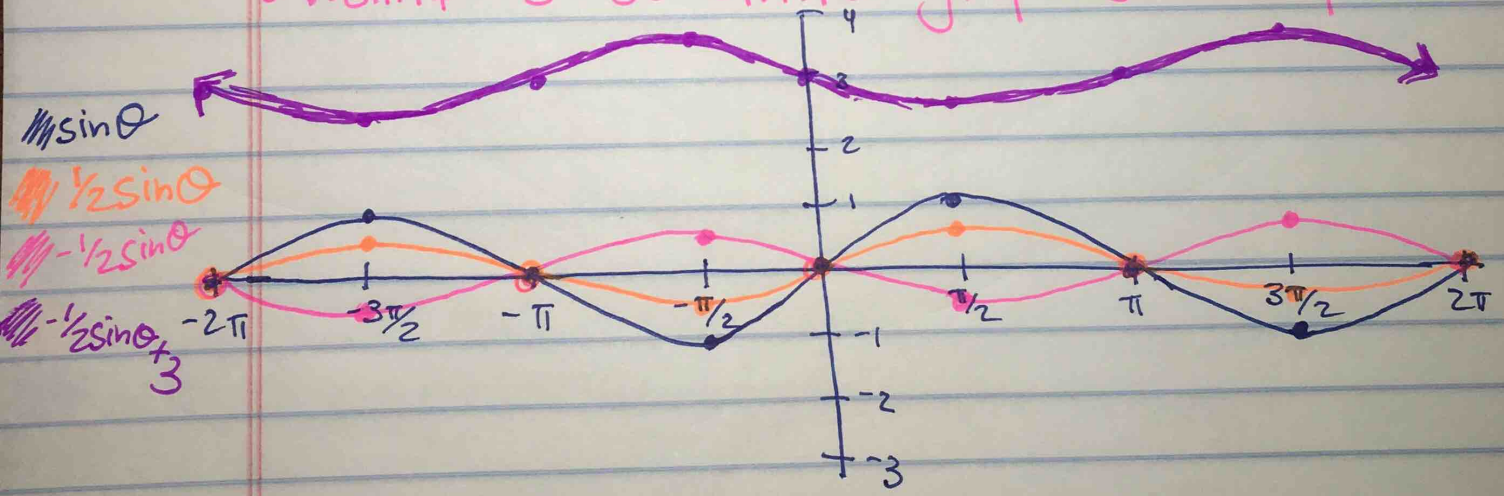
③ $y = \cos 2\theta - 1$

- period $= 2\pi/2 = \pi$ so it repeats twice as fast as original
- v. shift $= -1$ so entire graph moves down 1 unit



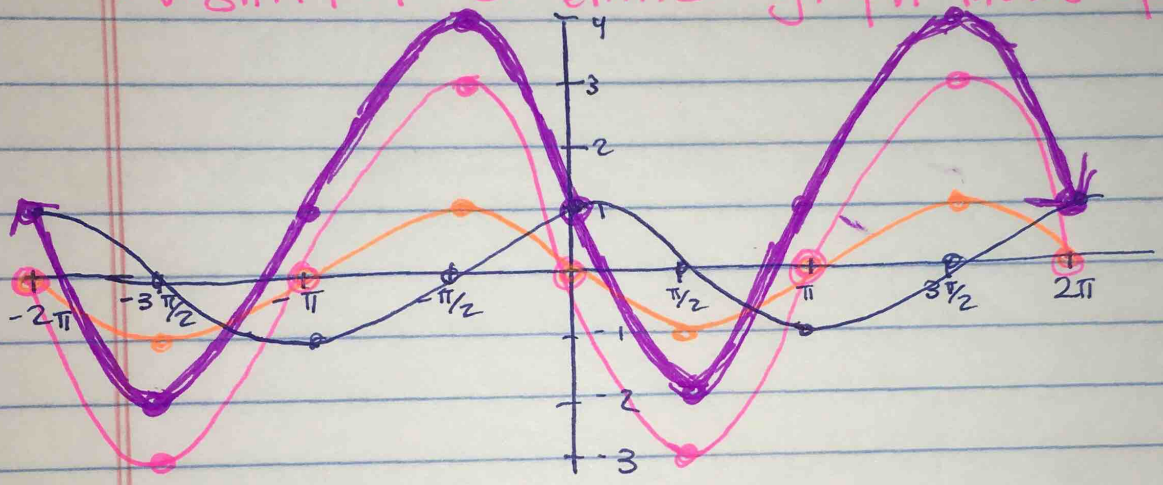
④ $y = -\frac{1}{2}\sin\theta + 3$

- amp $= \frac{1}{2}$ so its half as tall as original
- the negative flips it over the middle
- v. shift $= 3$ so entire graph shifts up 3 units



(5) $y = 3\cos(\theta + \pi/2) + 1$

- amp = 3 so 3 times as tall as original
- p. shift = $-\pi/2$ so it moves left $\pi/2$ units (1 tick mark)
- v. shift = 1 so entire graph moves up 1 unit

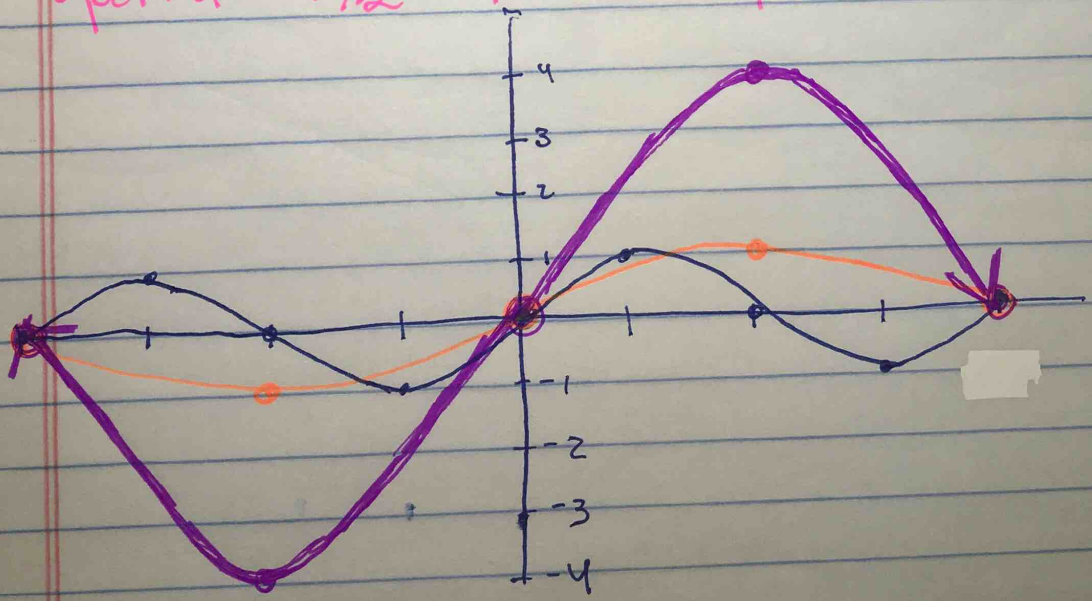


cos θ cos(θ + π/2) 3cos(θ + π/2) 3cos(θ + π/2) + 1

(6) $y = 4\sin \frac{1}{2}\theta$

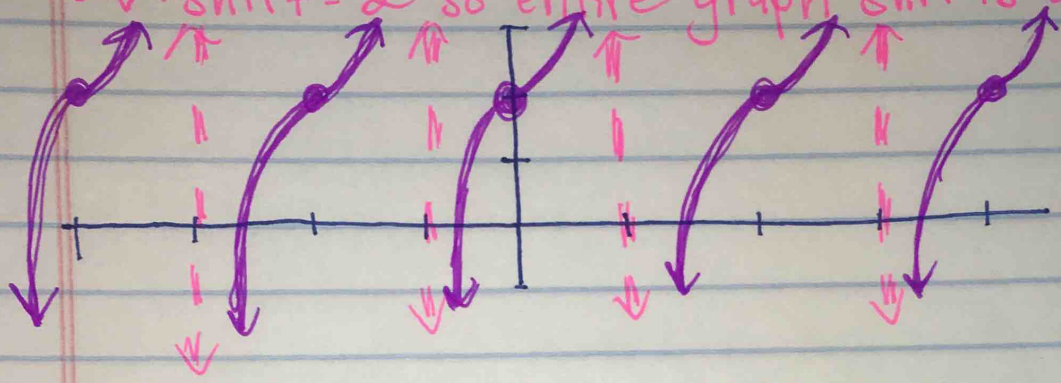
- amp = 4 so 4 times as tall as original
- period = $2\pi/\frac{1}{2} = 4\pi$ so it repeats twice as slow as original

sin θ
$\sin \frac{1}{2}\theta$
$4\sin \frac{1}{2}\theta$



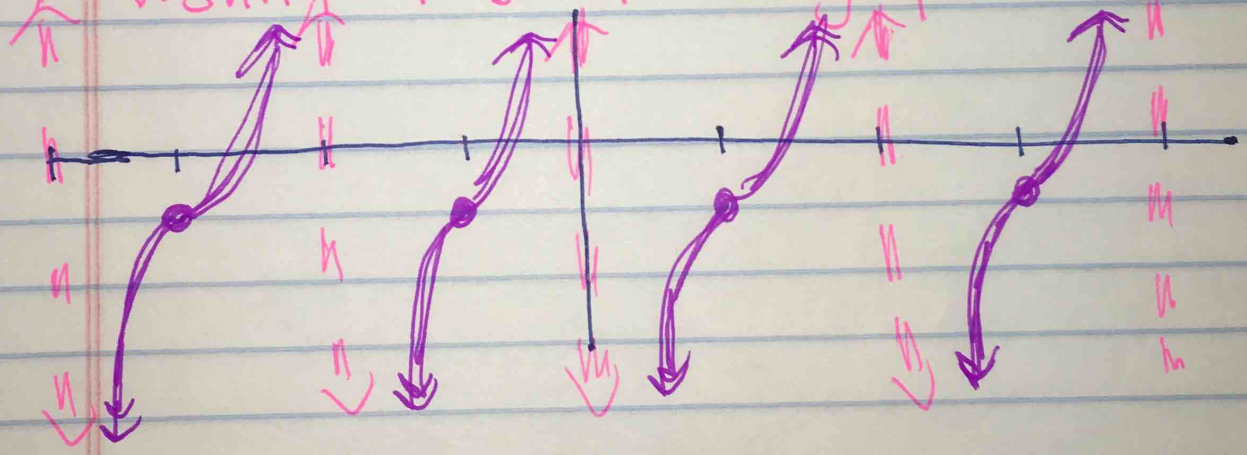
(7) $y = \tan\theta + 2$

- V. shift = 2 so entire graph shifts up 2 units



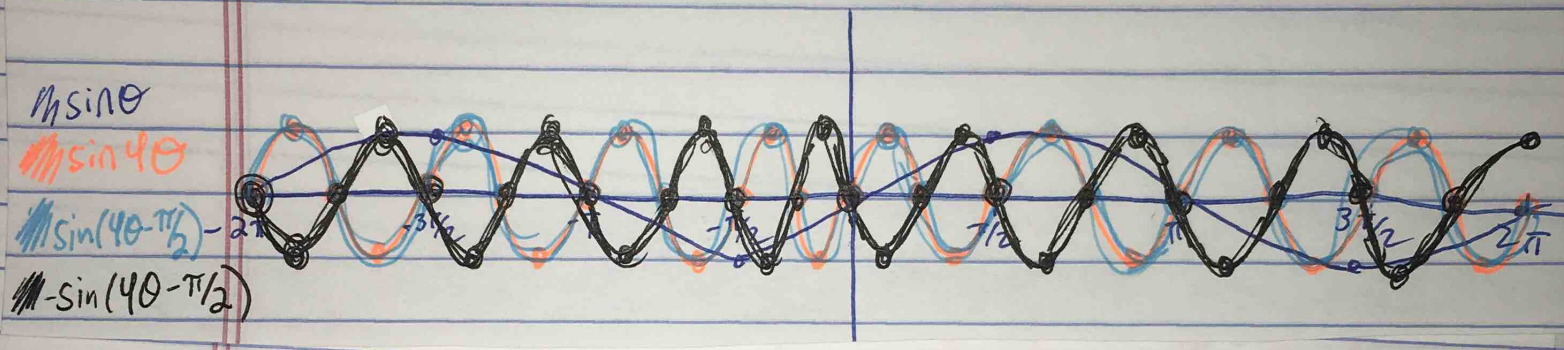
(8) $y = \tan(\theta - 3\pi/2) - 1$

- P. shift = $3\pi/2$ so entire graph moves right $3\pi/2$ units (3 tick marks)
- V. shift = -1 so entire graph moves down 1



(9) $y = -\sin(4\theta - \pi/2)$

- negative flips it over the middle
- period = $2\pi/4 = \pi/2$ so it repeats 4 times faster than the original
- p. shift = $\pi/2$ so entire graph moves right $\pi/2$ units (1 tick mark)



(10) $y = 3\cos\frac{\theta}{4}$

- amp = 3 so it is 3 times as tall as original
- period = $2\pi/1/4 = 8\pi$ so it repeats 4 times slower than the original