

HW 10 - GRAPHING SIN AND COS

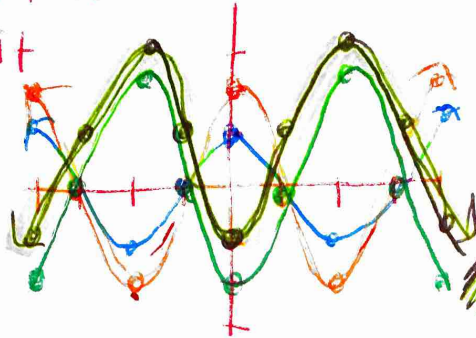
NAME Key F'16
(entire process)

Explain the transformation of each graph, then graph each function from -2π to 2π .

1. $y = -2\cos x + 1$

amplitude = 2 so its twice as tall as original
the negative flips it over x-axis
shifted up 1 unit

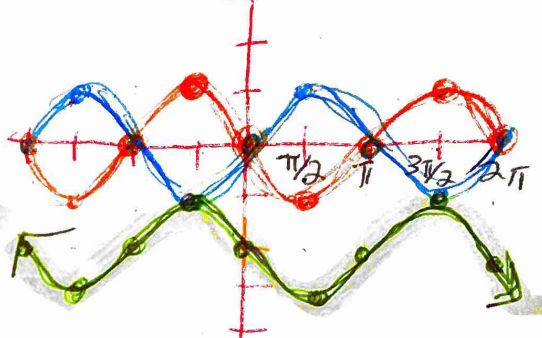
- $\cos x$
- $2\cos x$
- $-2\cos x$
- $-2\cos x + 1$



2. $y = \sin(x - \pi) - 2$

phase shift = π so it moves to the right π units (2 tick marks)
moves down 2 units

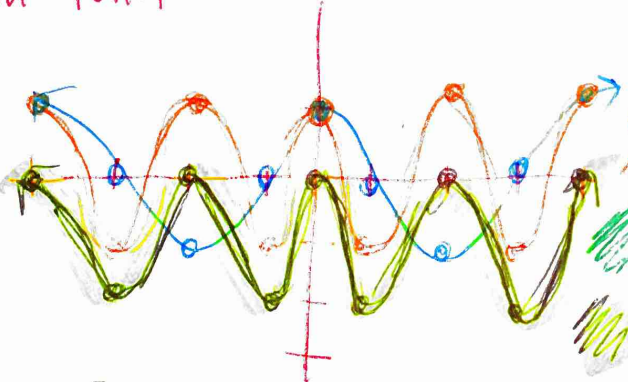
- $\sin x$
- $\sin(x - \pi)$
- $\sin(x - \pi) - 2$



3. $y = \cos 2x - 1$

period = $\frac{2\pi}{2} = \pi$ so it repeats twice as fast as original
shifts down 1 unit

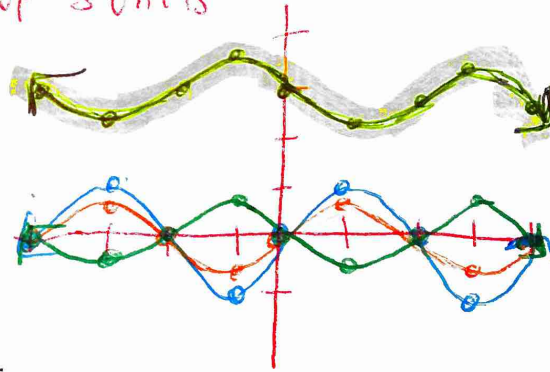
- $\cos x$
- $\cos 2x$
- $\cos 2x - 1$



4. $y = -\frac{1}{2}\sin x + 3$

amplitude = $\frac{1}{2}$ so its half as tall as original
the negative flips it over the x-axis
shifts up 3 units

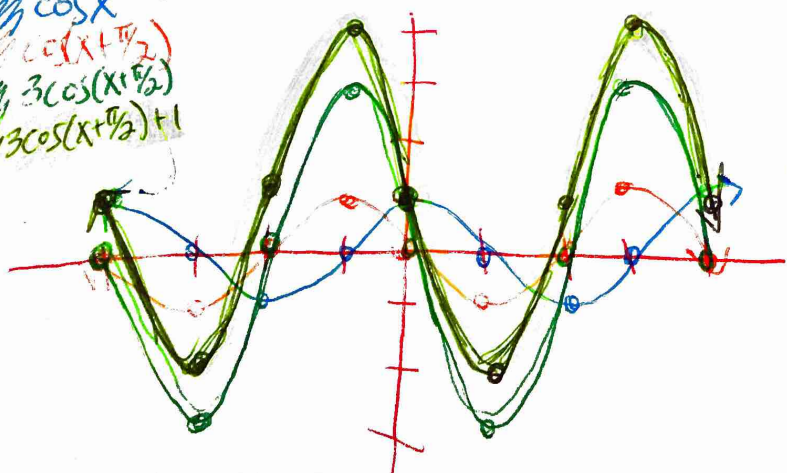
- $\sin x$
- $\frac{1}{2}\sin x$
- $-\frac{1}{2}\sin x$
- $-\frac{1}{2}\sin x + 3$



5. $y = 3\cos(x + \frac{\pi}{2}) + 1$

amplitude = 3 so its 3 times as tall as original
phase shift = $-\frac{\pi}{2}$ so it moves left $\frac{\pi}{2}$ unit (1 tick mark)
shifts up 1 unit

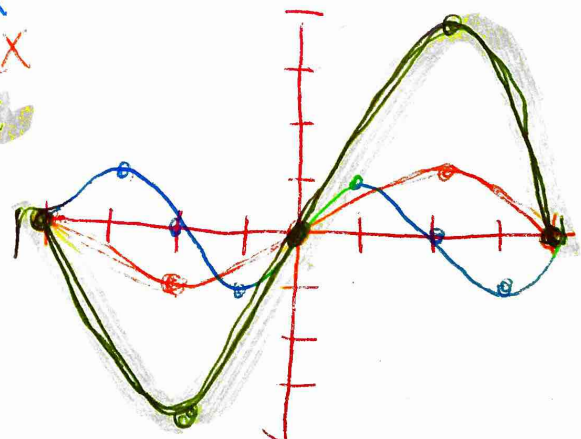
- $\cos x$
- $\cos(x + \frac{\pi}{2})$
- $3\cos(x + \frac{\pi}{2})$
- $3\cos(x + \frac{\pi}{2}) + 1$



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

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

- $\sin x$
- $\sin \frac{1}{2}x$
- $4\sin \frac{1}{2}x$



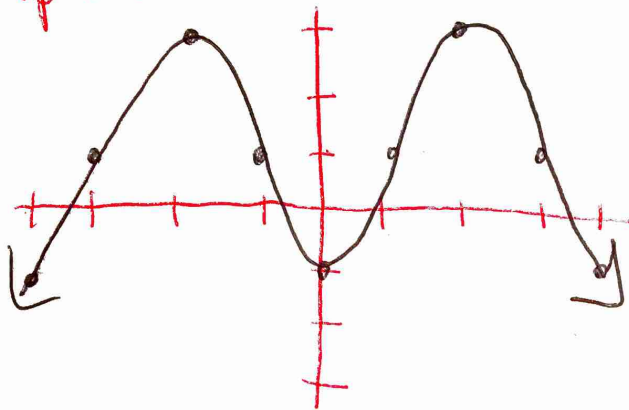
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NAME Key F'16
(final answer graphed)

Explain the transformation of each graph, then graph each function from -2π to 2π .

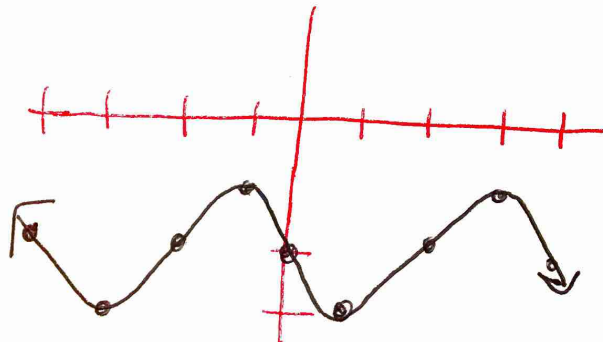
1. $y = -2\cos x + 1$

amplitude = 2 so its twice as tall as original
the negative flips it over the x-axis
shifted up 1 unit



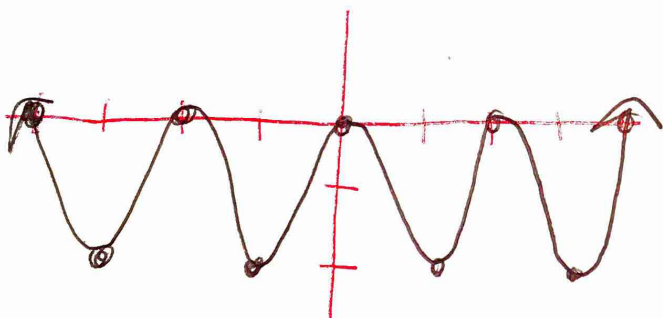
2. $y = \sin(x - \pi) - 2$

phase shift = π so it moves to the right π units (2 tick marks)
moves down 2 units



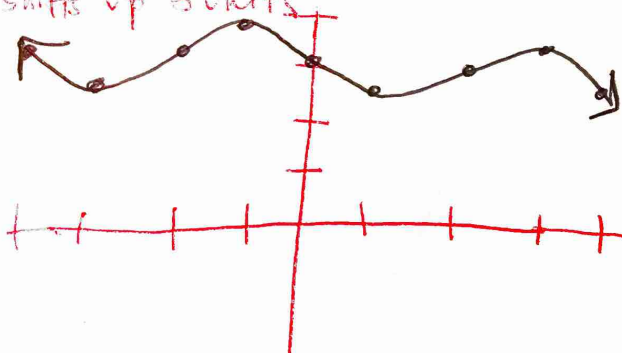
3. $y = \cos 2x - 1$

period = $\frac{2\pi}{2} = \pi$ so it repeats twice as fast as original
shifts down 1 unit



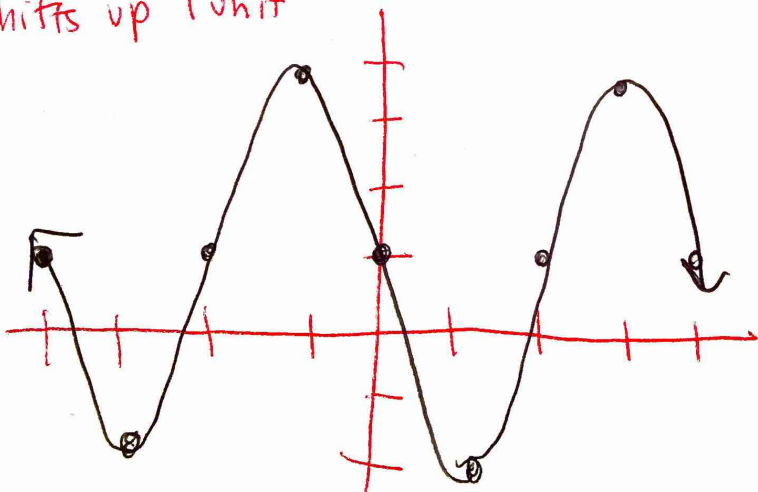
4. $y = -\frac{1}{2}\sin x + 3$

amplitude = $\frac{1}{2}$ so its half as tall as original,
the negative flips it over the x-axis
shifts up 3 units



5. $y = 3\cos(x + \frac{\pi}{2}) + 1$

amp = 3 so it is 3 times as tall as original
phase shift = $-\frac{\pi}{2}$ so it moves left $\frac{\pi}{2}$ units (1 tick mark)
shifts up 1 unit



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

amplitude = 4 so it is 4 times as tall as original
period = $2\pi \cdot \frac{1}{2} = 4\pi$ so it repeats two times slower than original

