Section 6.6: Graphs of Transformed Sine and Cosine Functions

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1:17 PM

transformations of sine and cosine graphs:

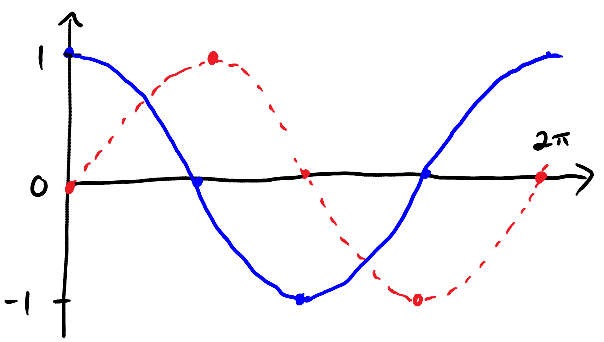
$$y = A \sin(Bx - C) + D$$

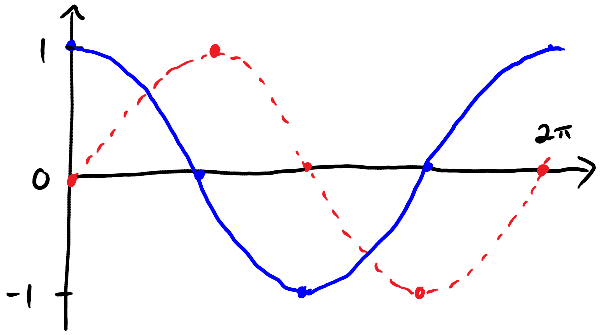
- A: amplitude is $|A|$; if $A < 0$, flips over x-axis
- B: period is $\frac{2\pi}{|B|}$ so B expands/contracts horizontally; if $B < 0$, flips over y-axis
- D: shifts up by D

note: same rules for cosine!

but what about C?

sketch $y = \sin(x + \pi/2)$ ← shifts left by $\pi/2$ (¼ of the period)





note: $\sin\left(x + \pi/2\right) = \cos x$

shifting left/right uses same rules we learned previously for $y = f(x)$

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what about $Bx+C$ / $Bx-C$ for $B \neq 1$? } I will not test this

$y = \sin(2x - \pi)$ ← shifted right by $\pi/2$

$= \sin\left[2\left(x - \pi/2\right)\right]$

↑ period is π

phase shift: $\frac{C}{B}$