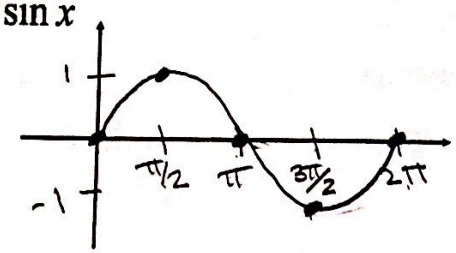
Sine Graphs with Dilations

$y = \sin x$



amplitude: 1

period: 2π

domain: $[0, 2\pi]$

range: $[-1, 1]$

In general: $y = \pm a \cdot \sin(bx)$

Period: $\frac{2\pi}{b}$ or $\frac{360°}{b}$

Horizontal Dilation

negative means reflect over x-axis

$|a|$ = amplitude vertical dilation stretch/shrink

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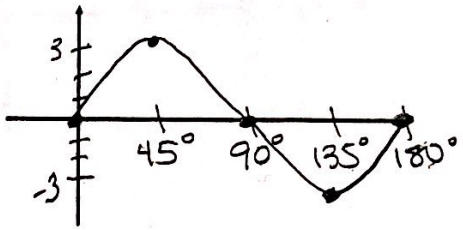
1) $y = 3\sin 2\theta$ ← Degrees



amplitude: 3

period: $\frac{360°}{b} = \frac{360°}{2} = 180°$

domain: $[0°, 180°]$

range: $[-3, 3]$

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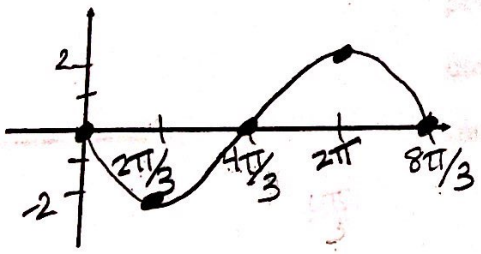
2) $y = -2\sin \frac{3}{4}x$ ← Radians (b)



amplitude: $|-2| = 2$

period: $\frac{2\pi}{b} = \frac{2\pi}{3/4} = \frac{2\pi}{1} \cdot \frac{4}{3} = \frac{8\pi}{3}$

domain: $[0, \frac{8\pi}{3}]$

range: $[-2, 2]$

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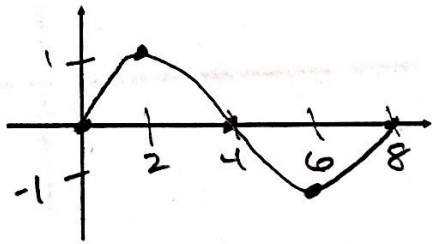
3) $y = \sin \frac{\pi x}{4}$ ← Radians (b)



amplitude: 1

period: $\frac{2\pi}{\pi/4} = 2\pi \cdot \frac{4}{\pi} = 8$

domain: $[0, 8]$

range: $[-1, 1]$