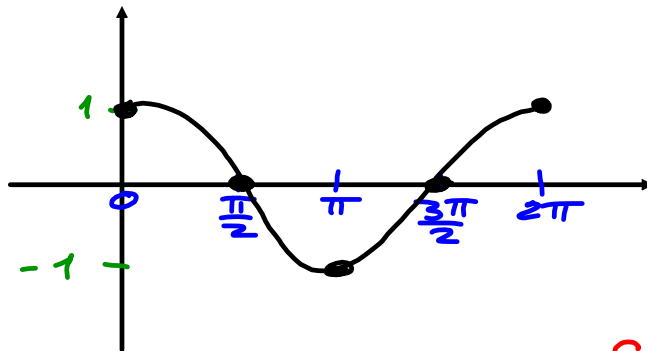


Cosine Graph with Dilations

$$y = \cos x$$



amplitude: 1

period: 2π

domain: $[0, 2\pi]$

range: $[-1, 1]$

~~even or odd?~~

$$\cos(-x) = \cos(x)$$

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

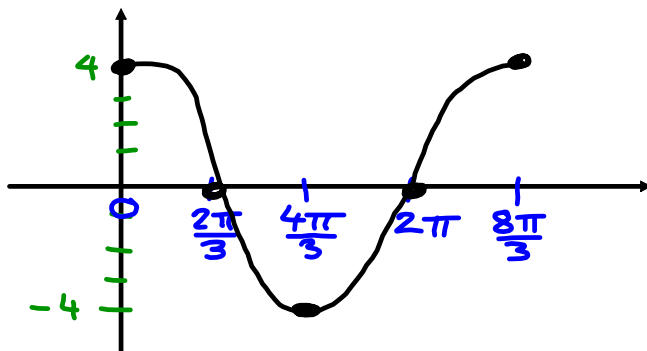
"-a"
reflection
over horizontal
axis

|a| = amplitude
vertical dilation

horizontal
dilation
frequency/period
period = $\frac{2\pi}{b}$

APPLET

1) $y = 4 \cos \frac{3x}{4} = 4 \cos \left(\frac{3}{4}x \right)$



amplitude: 4

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

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

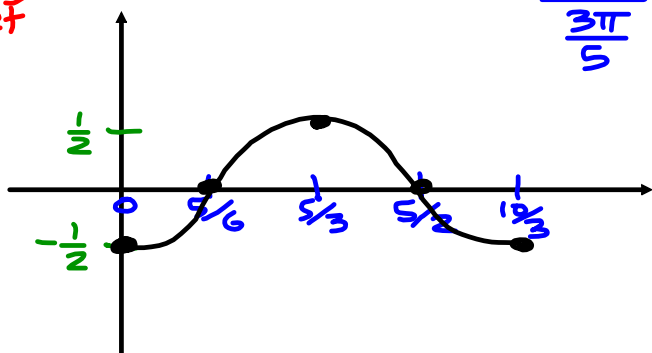
range: $[-4, 4]$

~~even or odd?~~

* $\frac{3}{4}x = 0 \implies x = 0$ $\frac{3}{4}x = 2\pi \implies x = \frac{8\pi}{3}$

2) $y = -\frac{1}{2} \cos \frac{3\pi x}{5}$

reflect



amplitude: $\frac{1}{2}$

$\frac{2\pi}{\frac{3\pi}{5}} \rightarrow$ period: $\frac{10}{3}$

* domain: $[0, \frac{10}{3}]$

range: $[-\frac{1}{2}, \frac{1}{2}]$

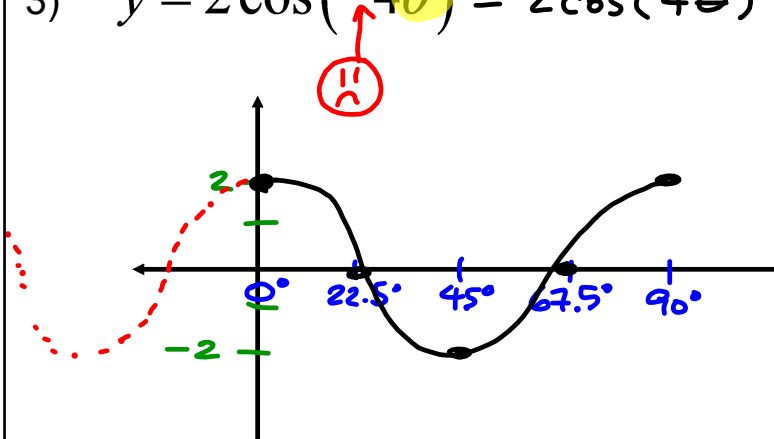
even or odd?

* $\frac{3\pi}{5}x = 0$
 $x = 0$

$\frac{5}{3\pi} \cdot \frac{3\pi}{5}x = 2\pi \frac{5}{3\pi}$
 $x = \frac{10}{3}$

3) $y = 2 \cos(-4\theta) = 2 \cos(4\theta)$

use degrees



amplitude: 2

period: $\frac{360^\circ}{4} = 90^\circ$

* domain: $[0, 90^\circ]$

range: $[-2, 2]$

even or odd?

* $4\theta = 0^\circ$
 $\theta = 0^\circ$

$4\theta = 360^\circ$
 $\theta = 90^\circ$