$$y = -\frac{1}{2}\sin x + 3.5$$

$$(x, y) \rightarrow \left(x, -\frac{1}{2}y + 3.5\right)$$

$y = \sin x$

x	y
0	0
90	1
180	0
270	-1
360	0

x	y
0	3.5
90	3
180	3.5
270	4
360	3.5

Horizontal Translation and Stretch

$y = \cos 2(x + 60^\circ)$

h.s of 1/2 (stretch or compress the wave lengths.)

h.t of -60° (shift the graph, x-intercepts change)

★ Affects the period

Original period 360° $\Longrightarrow$ h.s of 1/2

* period $\frac{1}{2}$ of 360° $= 180^\circ$

* textbook pg 249

H.S $= \frac{1}{|b|}$ period $\frac{360^\circ}{|b|}$

In general,

$y = a \sin b(x-c) + d$

or $y = a \cos b(x-c) + d$

a = v.s / amp. / radius

b = h.s. / period $= \frac{360}{|b|}$

c = h.t / shift

d = v.t / sinusoidal axis / axle of wheel

Example: $y = 2\sin 3\left(x - \frac{\pi}{6}\right) + 2$

$(x, y) \to \left(\frac{1}{3}x + \frac{\pi}{6}, 2y + 2\right)$

x	y
0	0
$\pi/2$	1
π	0
$3\pi/2$	-1
2π	0

$\hookrightarrow$

x	y
$\pi/6$	2
$\pi/3$	4
$\pi/2$	2
$2\pi/3$	0
$5\pi/6$	2

Amp = 2

S.A = 2

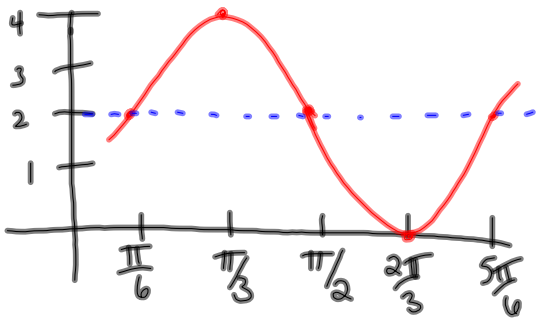
period $= \frac{1}{3} \times 2\pi = \frac{2\pi}{3}$

min = 0

max = 4

D: $x / x \in R$

R: $\{y / 0 \le y \le 4, y \in R\}$



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