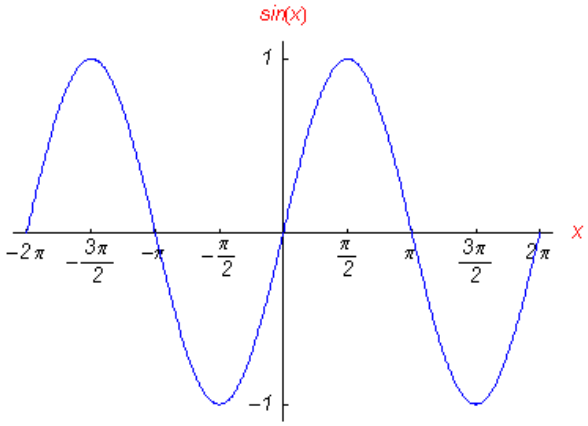
Trigonometric Graphs and Transformations: Sin and Cos

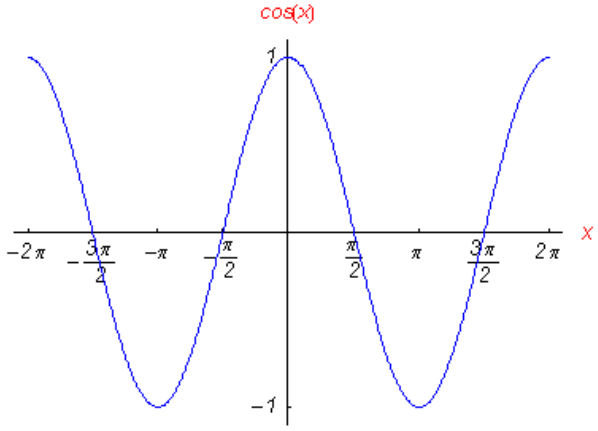
sin (x)



sin(x)

Domain: all real numbers
Range: -1 ≤ y ≤ 1
Amplitude: 1
Period: 2 π

cos (x)

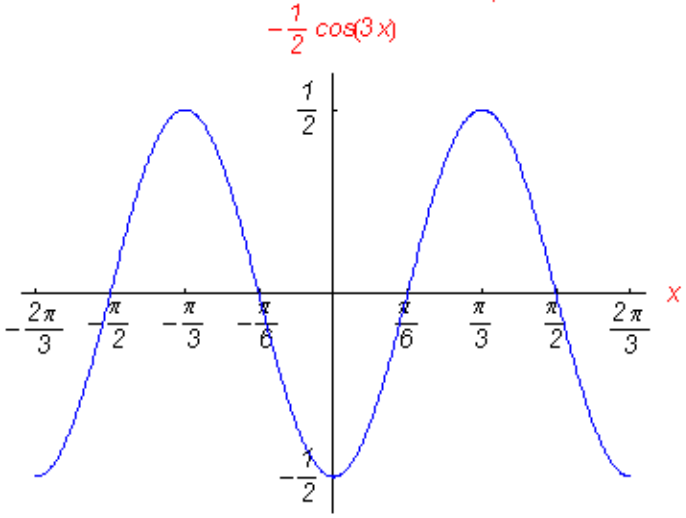


cos(x)
Domain: all real numbers
Range: -1 ≤ y ≤ 1
Amplitude: 1
Period: 2 π

y = A sin (Bx + C) + D
y = A cos (Bx + C) + D

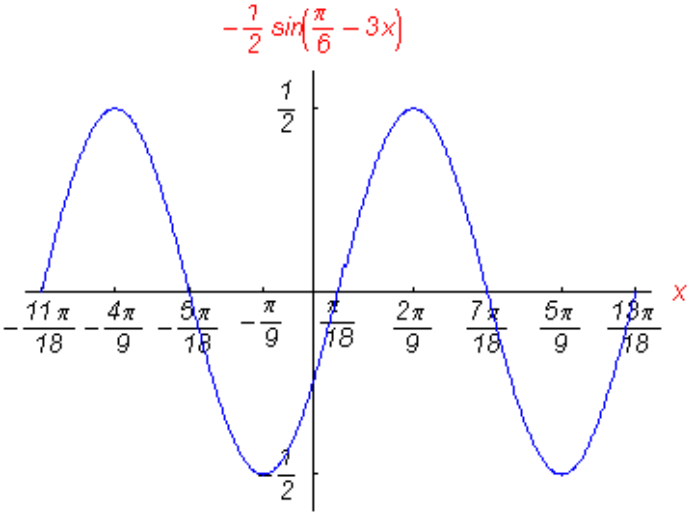
Amplitude = |A|
Period = 2 π / B
Phase Shift = - C/ B
Vertical Shift = D
X-axis flip = - A

Graph $y = \frac{-1}{2}\cos(3x)$.



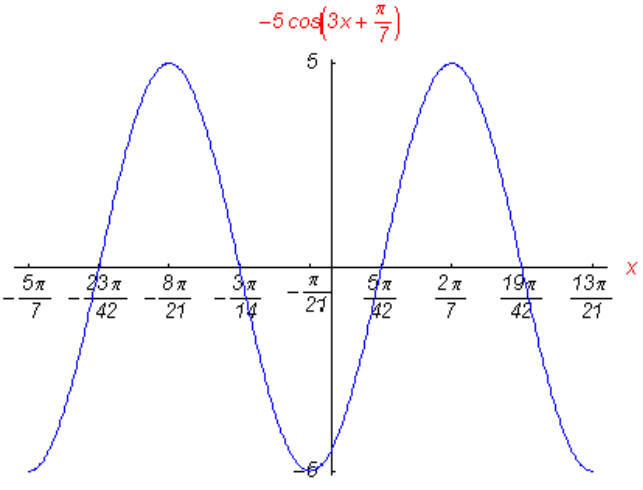
Amplitude: 1/2
Period: 2 π / 3
Phase Shift: 0
Vertical Shift: 0
X-axis flip

Graph $y = -\frac{1}{2}\sin\left(\frac{\pi}{6} - 3x\right)$.



Amplitude: 1/2
Period: 2 π / 3
Phase Shift: π / 18
Vertical Shift: 0
X-axis flip

Graph $y = -5\cos\left(3x + \frac{\pi}{7}\right)$.



Amplitude: 5
Period: 2 π / 3
Phase Shift: - π / 21
Vertical Shift: 0
X-axis flip

Graph and list amplitude, period, phase shift, vertical shift and x-axis flip for each of the following:

1. $y = \sin 2x - 2$

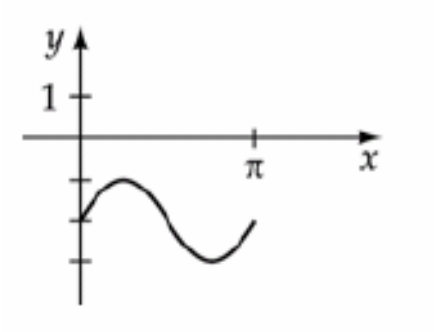
2. $y = 4\cos(\pi x - 2) + 1$

3. $y = -\sin(\pi x + 1) - 2$

4. $y = 3\cos\frac{1}{2}x$

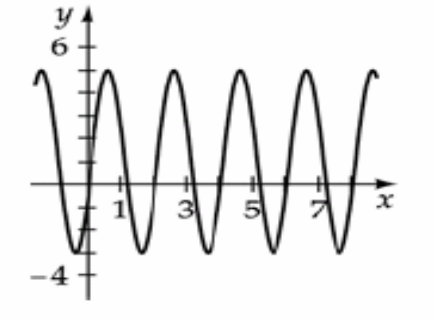
Graph and list amplitude, period, phase shift, vertical shift and x-axis flip for eah of the following:

1. $y = \sin 2x - 2$



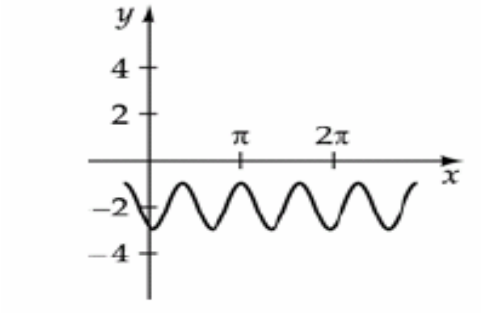
Amplitude: 1
Period: π
Phase Shift: 0
Vertical Shift: down 2
No x-axis flip

2 $y = 4\cos(\pi x - 2) + 1$



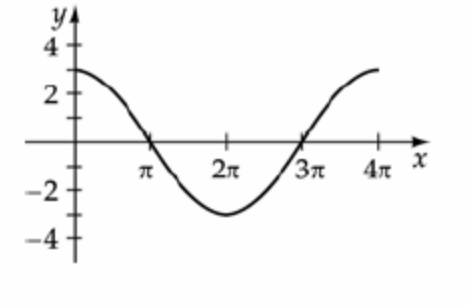
Amplitude: 4
Period: 2
Phase Shift: 2 / π
Vertical Shift: up 1
No x-axis flip

3. $y = -\sin(\pi x + 1) - 2$



Amplitude: 1
Period: 2
Phase Shift: -1/ π
Vertical Shift: down 2
X-axis flip

4. $y = 3\cos\frac{1}{2}x$



Amplitude: 3
Period: 4 π
Phase Shift: 0
Vertical Shift: 0
No x-axis flip