Transformations of trigonometric graphs

Function	Mid- line	Min Value	Max Value	Range	Period
$y = bsin\,x$ and $y = b\cos x$					
$y = 2\sin x$	$y=0$	-2	2	$[-2,2]$	2π rads/360°
$f(x) = \frac{1}{2}\cos x$	$y=0$	-0.5	0.5	$[-0.5,0.5]$	2π rads/360°
$f(x) = -5\cos x$	$y=0$	-5	5	$[-5,5]$	2π rads/360°
$y = \sin cx$ and $y = \cos cx$					
$y = \cos 2x$	$y=0$	-1	1	$[-1,1]$	π rads/180°
$f(x) = \sin\frac{3x}{2}$	$y=0$	-1	1	$[-1,1]$	$\frac{4}{3}\pi$ rads/240°
$y = \cos\frac{2x}{3}$	$y=0$	-1	1	$[-1,1]$	3π rads/540°
$y = a + \sin x$ and $y = a + \cos x$					
$f(x) = -1 + \sin x$	$y=-1$	-2	0	$[-2,0]$	2π rads/360°
$f(x) = 4 + \cos x$	$y=4$	3	5	$[3,5]$	2π rads/360°
$y = -2 + \cos x$	$y=-2$	-3	-1	$[-3,-1]$	2π rads/360°
$y = 3 + \sin x$	$y=3$	2	4	$[2,4]$	2π rads/360°

Transformation	Change observed, from basic functions: $y = \sin x$ and $y = \cos x$
$y = bsin\,x$ and $y = b\cos x$	→ If $\|b\| > 1$ then the graph is stretched along the y-axis. → If $\|b\| < 1$ e.g $1/2$, the graph shrinks along the y-axis → the range changes but the period doesn't → If b is negative e.g $y = -\cos x$ then $y = \cos x$ is reflected in the x-axis
$y = \sin cx$ and $y = \cos cx$	→ c = no. of cycles in $2\pi/360°$ ⇒ If c = 2 then the period is just π rads/180° ⇒ twice as quick → Only the inputs/x-values and ∴ period is effected by this transformation.
$y = a + \sin x$ and $y = a + \cos x$	→ If $a > 1$ then there will be a translation of a units in the +ve direction of the y-axis → If $a < 1$ then there will be a translation of a units in the -ve direction of the y-axis

→ a = the midway line $a + |b|$ = max value
→ Range = $[a-|b|, a+|b|]$ $a - |b|$ = min value