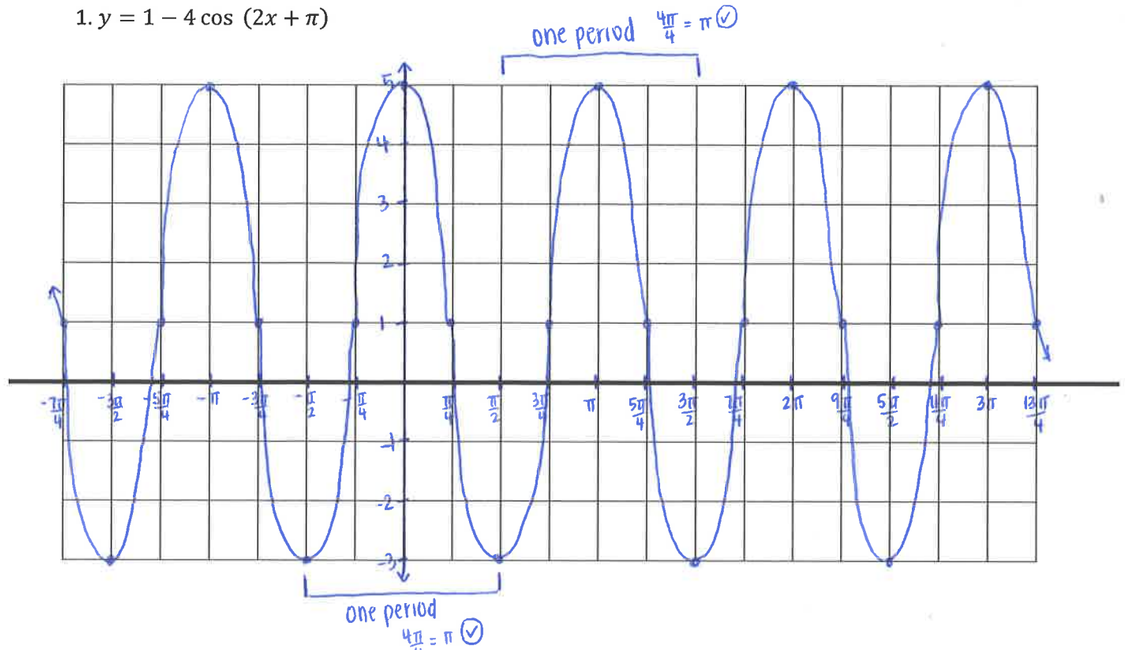
Pre-Calculus (A)
Section 4.5 Quiz Review

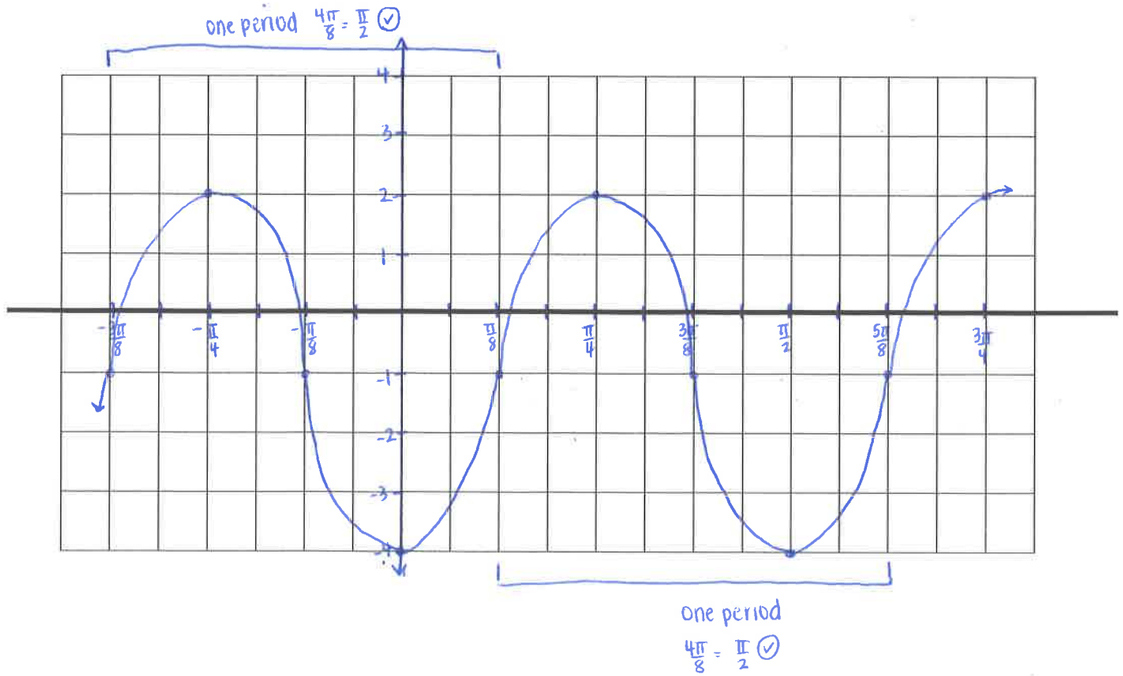
Name : Key
Date : _____

Graph two full periods of the function and label the periods on the graph. You must give key points using your table of values. Please state the domain and the range of each graph.

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



2. $y = -1 + 3\sin\left(4x - \frac{\pi}{2}\right)$



$d=1 \quad a=-4 \quad b=2 \quad c=-\pi$

① $y = 1-4\cos(2x+\pi)$

To find new x-values:

$2x+\pi=0$

$2x=-\pi$

$\boxed{x=-\frac{\pi}{2}}$

$2x+\pi=\frac{\pi}{2}$

$2x=\frac{\pi}{2}-\frac{\pi}{1}$

$2x=\frac{\pi}{2}-\frac{2\pi}{2}$

$2x=-\frac{\pi}{2}$

$x=-\frac{\pi}{2}\cdot\frac{1}{2}$

$\boxed{x=-\frac{\pi}{4}}$

$2x+\pi=\pi$

$2x=0$

$\boxed{x=0}$

$2x+\pi=\frac{3\pi}{2}$

$2x=\frac{3\pi}{2}-\frac{\pi}{1}$

$2x=\frac{3\pi}{2}-\frac{2\pi}{2}$

$2x=\frac{\pi}{2}$

$x=\frac{\pi}{2}\cdot\frac{1}{2}$

$\boxed{x=\frac{\pi}{4}}$

$2x+\pi=2\pi$

$2x=\pi$

$\boxed{x=\frac{\pi}{2}}$

new x	x-axis	y-axis	$-4y$	$-4y+1$
$-\pi/2$	0	1	-4	-3
$-\pi/4$	$\pi/2$	0	0	1
0	π	-1	4	5
$\pi/4$	$3\pi/2$	0	0	1
$\pi/2$	2π	1	-4	-3

domain: $(-\infty, \infty)$

range: $[-3, 5]$

period $= \frac{2\pi}{b} = \frac{2\pi}{2} = \pi$

phase shift $= \left|\frac{c}{b}\right| = \left|\frac{-\pi}{2}\right| = \frac{\pi}{2}$ units to the left since $c<0$

$d=-1 \quad a=3 \quad b=4 \quad c=\frac{\pi}{2}$

② $y = -1+3\sin\left(4x-\frac{\pi}{2}\right)$

To find new x-values:

$4x-\frac{\pi}{2}=0$

$4x=\frac{\pi}{2}$

$x=\frac{\pi}{2}\cdot\frac{1}{4}$

$\boxed{x=\frac{\pi}{8}}$

$4x-\frac{\pi}{2}=\frac{\pi}{2}$

$4x=\pi$

$\boxed{x=\frac{\pi}{4}}$

$4x-\frac{\pi}{2}=\pi$

$4x=\frac{\pi}{1}+\frac{\pi}{2}$

$4x=\frac{2\pi}{2}+\frac{\pi}{2}$

$4x=\frac{3\pi}{2}$

$x=\frac{3\pi}{2}\cdot\frac{1}{4}$

$\boxed{x=\frac{3\pi}{8}}$

$4x-\frac{\pi}{2}=\frac{3\pi}{2}$

$4x=\frac{3\pi}{2}+\frac{\pi}{2}$

$4x=\frac{4\pi}{2}$

$4x=2\pi$

$x=\frac{2\pi}{4}$

$\boxed{x=\frac{\pi}{2}}$

$4x-\frac{\pi}{2}=2\pi$

$4x=\frac{2\pi}{1}+\frac{\pi}{2}$

$4x=\frac{4\pi}{2}+\frac{\pi}{2}$

$4x=\frac{5\pi}{2}$

$x=\frac{5\pi}{2}\cdot\frac{1}{4}$

$\boxed{x=\frac{5\pi}{8}}$

new x	x-axis	y-axis	3y	3y-1
$\pi/8$	0	0	0	-1
$\pi/4$	$\pi/2$	1	3	2
$3\pi/8$	π	0	0	-1
$\pi/2$	$3\pi/2$	-1	-3	-4
$5\pi/8$	2π	0	0	-1

domain: $(-\infty, \infty)$

range: $[-4, 2]$

period: $\frac{2\pi}{b}=\frac{2\pi}{4}=\frac{\pi}{2}$

phase shift: $\left|\frac{c}{b}\right|=\left|\frac{\frac{\pi}{2}}{4}\right|=\left|\frac{\pi}{2}\div\frac{4}{1}\right|=\left|\frac{\pi}{2}\cdot\frac{1}{4}\right|=\left|\frac{\pi}{8}\right|=\frac{\pi}{8}$ units to the right since $c>0$

3. Identify a, b, c, and d; describe the graph of $y = -2\cos\left(\frac{1}{2}x - \pi\right) + 3$.

a= -a

b= $\frac{1}{a}$

c= π

d= 3

vertical Stretch by a factor of 2

horizontal Stretch since $0<b<1$

phase shift 2π units to the right since $c>0$

vertical shift 3 units up

Is there a reflection? Yes, since the a-value is negative

P.S. $= \left|\frac{c}{b}\right| = \left|\frac{\pi}{\frac{1}{2}}\right| = \left|\frac{\pi}{1} \div \frac{1}{2}\right| = \left|\frac{\pi}{1} \cdot \frac{2}{1}\right| = |2\pi| = 2\pi$

Answer Key :

1) & 2) See Website for Solutions

3) a = -2; Vertical stretch by factor of 2, b = ½; Horizontal stretch, c = π; Phase shift 2π units to the right, d = 3; Vertical Shift 3 units up; Yes, there is a reflection