Transforming Sine & Cosine II (5.2) p251 day 4

Quiz 7

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p250#5,6

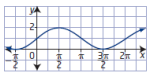
5. Match each function with its graph.

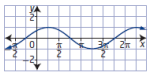
a) $y = \sin\left(x - \frac{\pi}{4}\right)$

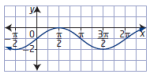
b) $y = \sin\left(x + \frac{\pi}{4}\right)$

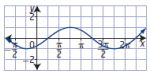
c) $y = \sin x - 1$

d) $y = \sin x + 1$

A 

B 

C 

D 

6. Write the equation of the sine function in the form $y = a \sin b(x - c) + d$ given its characteristics.

a) amplitude 4, period π, phase shift $\frac{\pi}{2}$ to the right, vertical displacement 6 units down

b) amplitude 0.5, period 4π, phase shift $\frac{\pi}{6}$ to the left, vertical displacement 1 unit up

c) amplitude $\frac{3}{4}$, period 720°, no phase shift, vertical displacement 5 units down

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what are the key points for sin(x) and cos(x)?

y=sin(x)

x	y
0	0
$\frac{\pi}{2}$	1
π	0
$\frac{3\pi}{2}$	-1
2π	0

y=cos(x)

x	y
0	1
$\frac{\pi}{2}$	0
π	-1
$\frac{3\pi}{2}$	0
2π	1

Transforming Sine & Cosine II (5.2) p251 day 4

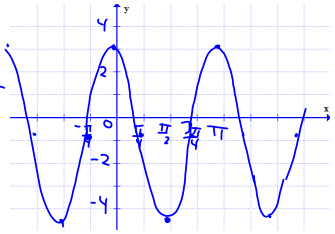
ex1: create mappings and graph

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

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

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

x	y	$\frac{1}{2}x - \frac{\pi}{4}$	$4y - 1$
0	0	$-\frac{\pi}{4}$	-1
$\frac{\pi}{2}$	1	0	3
π	0	$\frac{\pi}{4}$	-1
$\frac{3\pi}{2}$	-1	$\frac{\pi}{2}$	-5
2π	0	$\frac{3\pi}{4}$	-1

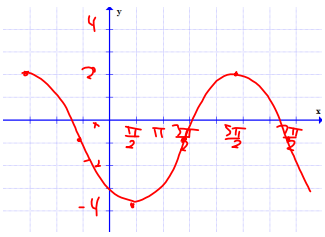


Transforming Sine & Cosine II (5.2) p251 day 4

ex2: create mappings and graph

$y = -3\cos 0.5\left(x - \frac{\pi}{2}\right) - 1$

x	y	$2x + \frac{\pi}{2}$	$-3y - 1$
0	1	$\frac{\pi}{2}$	-4
$\frac{\pi}{2}$	0	$\frac{3\pi}{2}$	-1
π	-1	$\frac{5\pi}{2}$	2
$\frac{3\pi}{2}$	0	$\frac{7\pi}{2}$	-1
2π	1	$\frac{9\pi}{2}$	-4



sheet #1-4

Transforming Sine & Cosine II (5.2) p251 day 4

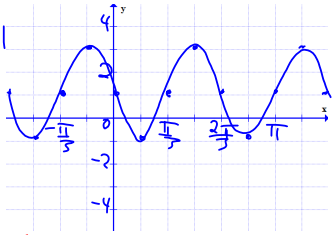
ex3: create mappings and graph

if we have time

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

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

x	y	$\frac{1}{3}x - \frac{\pi}{3}$	$2y + 1$
0	0	$-\frac{\pi}{3}$	1
$\frac{\pi}{2}$	1	0	3
π	0	$\frac{\pi}{3}$	1
$\frac{3\pi}{2}$	-1	$\frac{2\pi}{3}$	-1
2π	0	π	1



$(x, y) \to \left(\frac{x}{b} + c, a y + d\right)$

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

↑ x axis scale

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HW: graphing practice sheet
#1-4

$$(x,y)\rightarrow\left(\frac{1}{b}x+c,ay+d\right)$$