Today's Learning Goal(s):

Date: May 15, 19

By the end of the class, I will be able to:

a) determine how each transformation affects the sine and cosine curves.

Show Level 4 Exemplars

Last day's work: pp. 363-364 #1 – 4, 8, 9 [15,16] 26 3
pp. 370-372 #1 – 8, 13 [15]

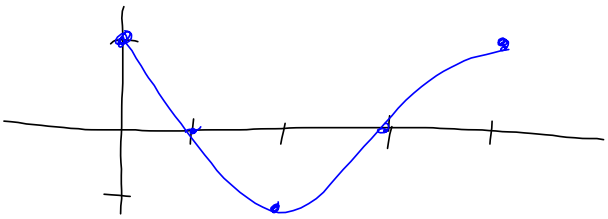
Today's Homework Practice includes:

pp. 377-378 A – U

p. 379 #1 – 3

p. 363 **2.** a) If $h(x) = \sin(5x) - 1$, calculate $h(25°)$.

b) If $f(x) = \cos x$ and $f(x) = 0$, list the values of x where $0° \leq x \leq 360°$.



$f(x)=0$

if $x=90°$ or $x=270°$

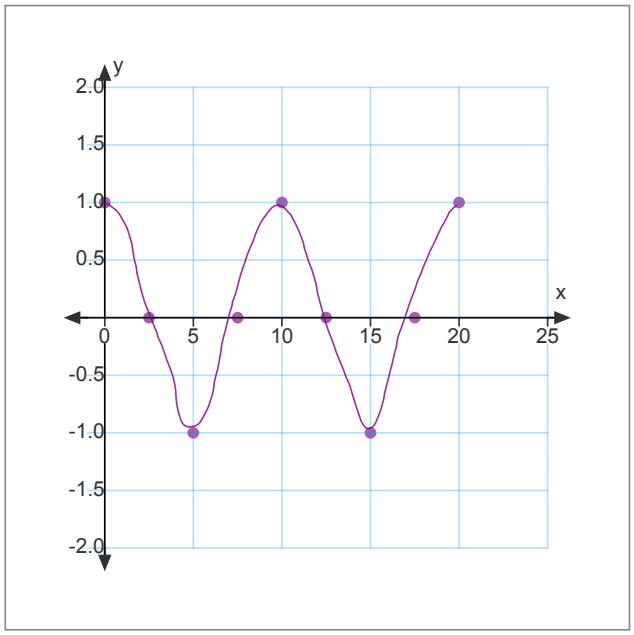
3. A buoy rises and falls as it rides the waves. The equation $h(t) = \cos(36t)°$ models the displacement of the buoy, $h(t)$, in metres at t seconds.

a) Graph the displacement from 0 s to 20 s, in 2.5 s intervals.

b) Determine the period of the function from the graph. – 10 sec

c) What is the displacement at 35 s? $h(35) = \cos(36(35)) = -1$

d) At what time, to the nearest second, does the displacement first reach −0.8 m? From Graph, $t \doteq 4$ sec



t	$h(t)$
0	1
2.5	0
5	-1
7.5	0
10	1
12.5	0
15	-1
17.5	0
20	1

or $-0.8 = \cos(36t)$

Let $x = 36t$

$-0.8 = \cos x$

$\cos^{-1}(-0.8) = x$

$x \doteq 143.13$

But $x = 36t$

$\therefore \frac{x}{36} = t$

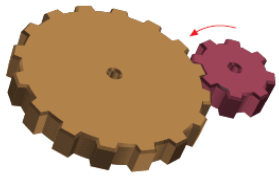
$t \doteq \frac{143.13}{36}$

$\doteq 3.97$

$\doteq 4$ sec.

p. 372 **Extending**

15. A gear of radius 1 m turns counterclockwise and drives a larger gear of radius 4 m. Both gears have their axes along the horizontal.



a) In which direction is the larger gear turning? – clockwise

b) If the period of the smaller gear is 2 s, what is the period of the larger gear?

c) In a table, record convenient intervals for each gear, to show the vertical displacement, d, of the point where the two gears first touched. Begin the table at 0 s and end it at 24 s. Graph vertical displacement versus time.

d) What is the displacement of the point on the large wheel when the drive wheel first has a displacement of -0.5 m?

e) What is the displacement of the drive wheel when the large wheel first has a displacement of 2 m?

f) What is the displacement of the point on the large wheel at 5 min?

b) Smaller

$\text{Speed}_S = \frac{d}{t}$

$= \frac{2\pi r}{\text{period}}$

$= \frac{2\pi(1)}{2}$

$= \pi$ m/s

larger

$\text{Speed}_L = \frac{d}{t}$

$\pi = \frac{2\pi(4)}{\text{period}}$

$\pi = \frac{8\pi}{\text{period}}$

$\text{period} = \frac{8\pi}{\pi}$

$= 8$ sec.

6.4 Exploring Transformations of Sinusoidal Functions

Date: May 15/19

***EXPLORE** the Math*: pp. 377-378 A-U

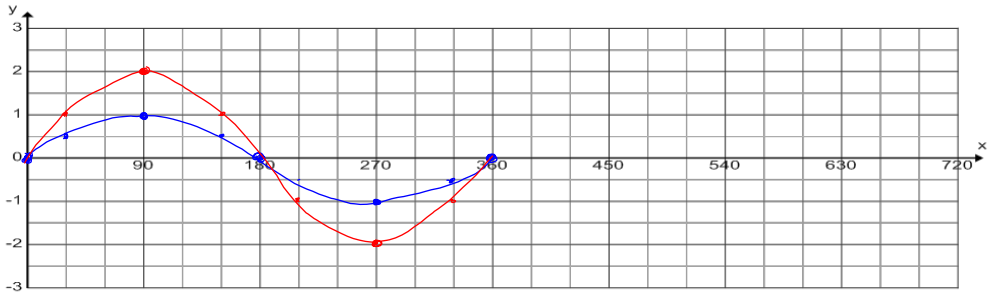
Part 1: The Graphs of $y = a\sin x$ and $y = a\cos x$.

Start with the 5 Key Points from the parent function.

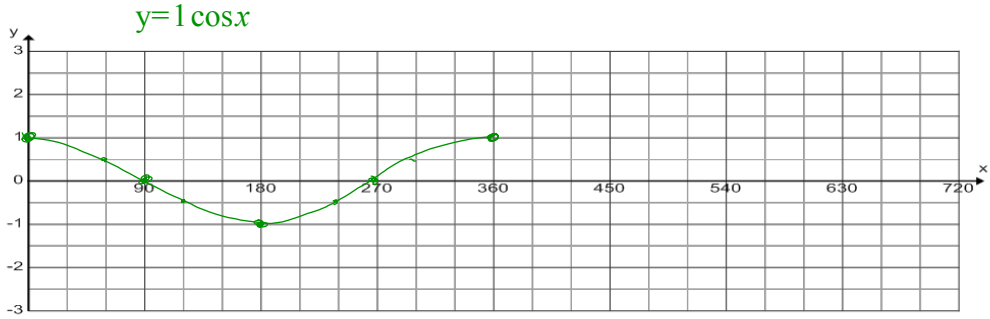
You may choose to add a few more for accuracy.

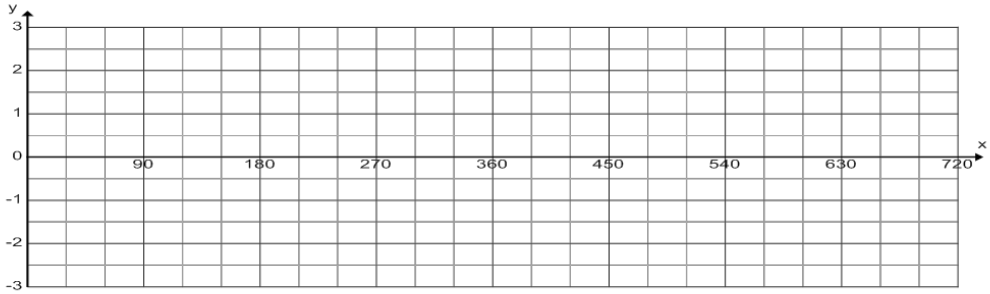
Note: Only 1 complete cycle is required.

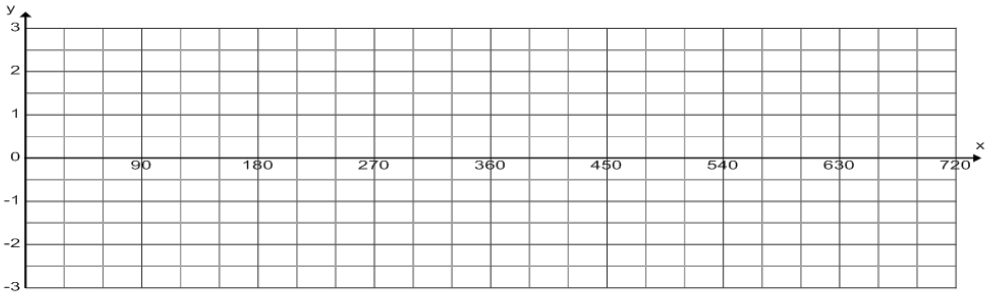
y=1 sin*x* y=2sin*x*



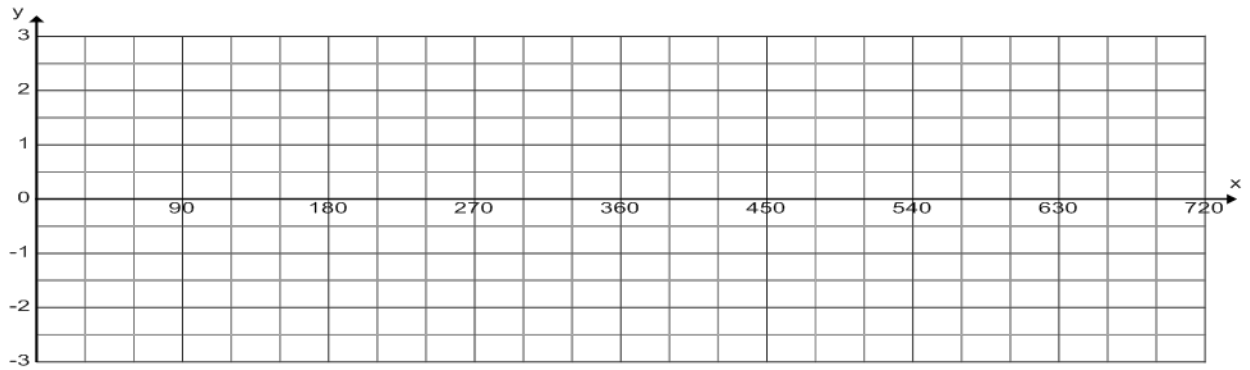
y=1 cos*x*

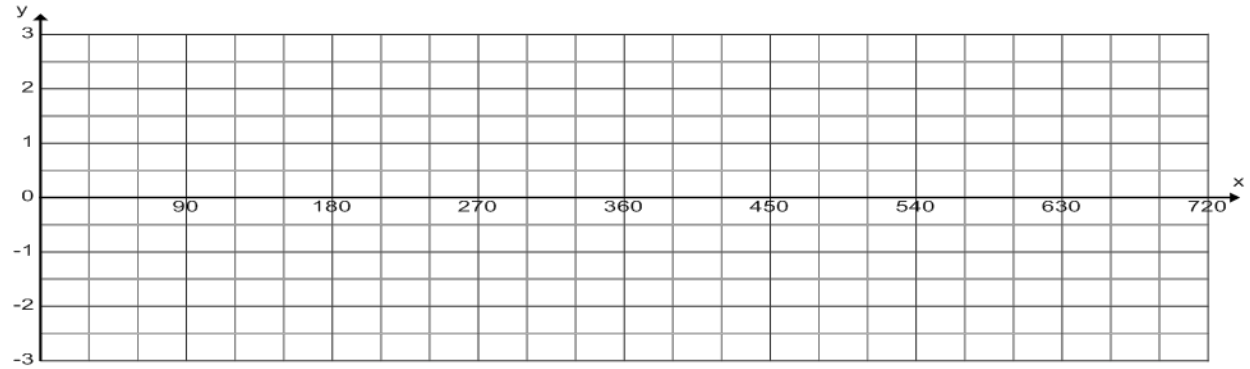




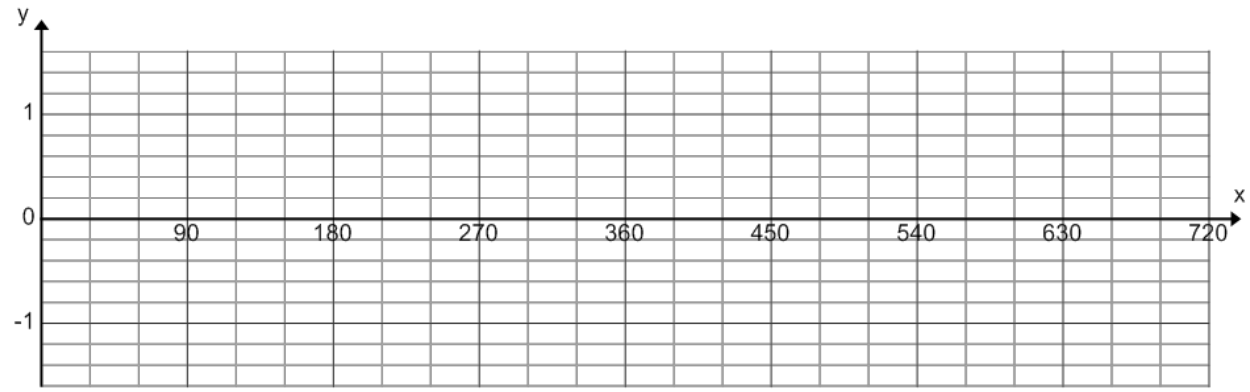


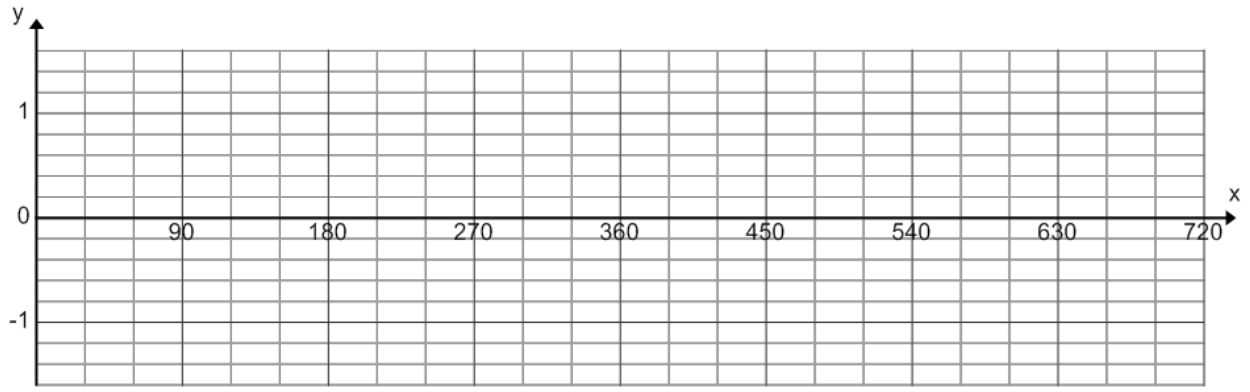
Part 2: The Graphs of $y = \sin x + c$ and $y = \cos x + c$.



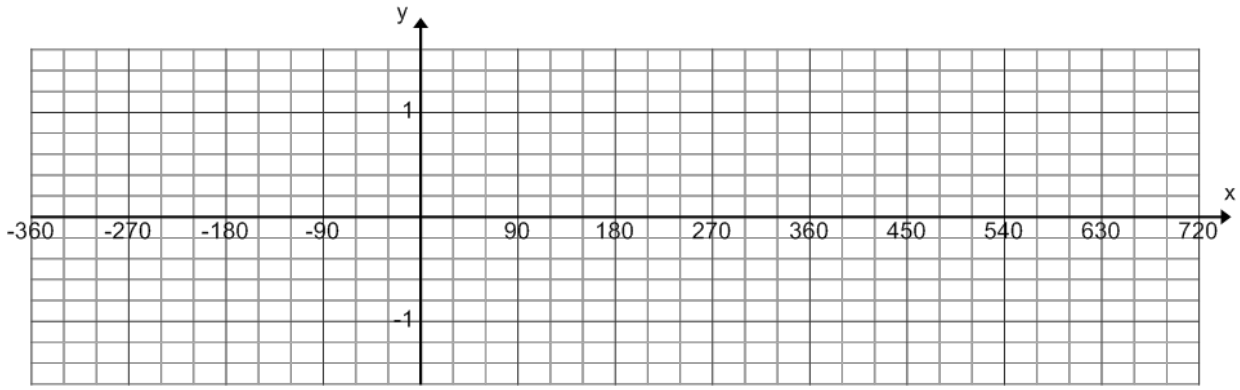


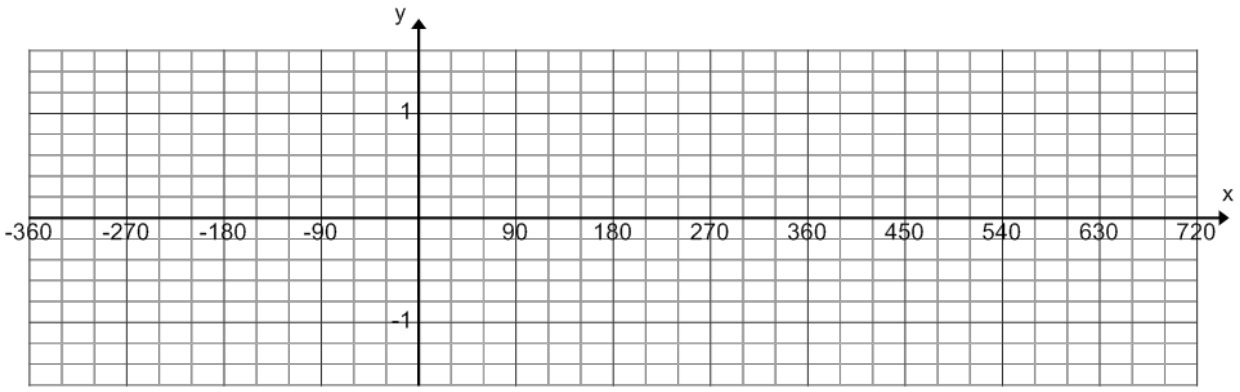
Part 3: The Graphs of $y = \sin kx$ and $y = \cos kx$.





Part 4: The Graphs of $y = \sin(x - d)$ and $y = \cos(x - d)$.





Summary of $y = a\sin\left(k\left(x-d\right)\right)+c$ and $y = a\cos\left(k\left(x-d\right)\right)+c$

The transformations that have occurred to $y = \sin x$ and $y = \cos x$ are:

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 363-364 #1 – 4, 8, 9 [15,16]
pp. 370-372 #1 – 8, 13 [15]

Today's Homework Practice includes:

pp. 377-378 A – U

p. 379 #1 – 3

6.2 SineTracer.gsp