Today's Learning Goal(s):

Date: _____

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

a) determine the how transformation affect the sine and cosine curves.

"Show What You Know" 6.1 is Today

Last day's work: p. 363 #8

pp. 370-372 #1 – <u>8</u>, 13 [15]

p. 372 # **8.** The diameter of a car's tire is 52 cm. While the car is being driven, the tire
[T] picks up a nail.

   a) Draw a graph of the height of the nail above the ground in terms of the distance the car has travelled since the tire picked up the nail.
   b) How high above the ground will the nail be after the car has travelled 0.1 km?
   c) How far will the car have travelled when the nail reaches a height of 20 cm above the ground for the fifth time?
   d) What assumption must you make concerning the driver's habits for the function to give an accurate height?

$$C = 2\pi r$$
$$= 2\pi(26)$$
$$= 163.36$$

8. a)

Height of nail above ground (cm)
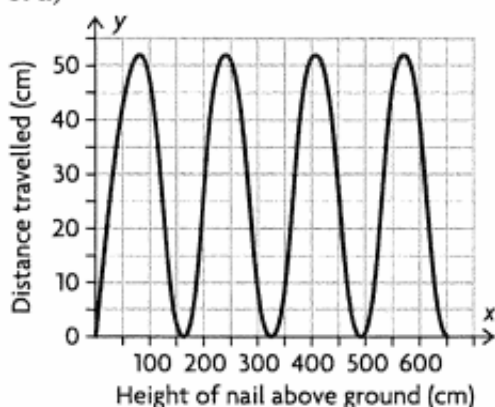
b) 0.1 km = 100 m = 10 000 cm. Since the car travels 163.36 cm for each revolution of the tire, after it has travelled 10 000 cm, the tire has made approximately 10 000 ÷ 163.36 or 61.21 revolutions. Since the height of the nail above the ground is 0 cm after 1 revolution, it is also 0 cm above the ground after 61 revolutions. Therefore, the height of the nail above the ground after 61.21 revolutions is the same as it is after 61.21 − 61 or 0.21 revolutions. During 1 revolution, the distance travelled is 163.36 cm, so during 0.21 revolutions, the distance traveled is 163.36 × 0.21 or 34.31 cm. From the graph in part a, the height of the nail above the ground after the car has travelled 34.31 cm is approximately 29 cm.

c) From the graph, when the nail reaches a height of 20 cm above the ground for the fifth time, the car will have travelled approximately 360 cm.

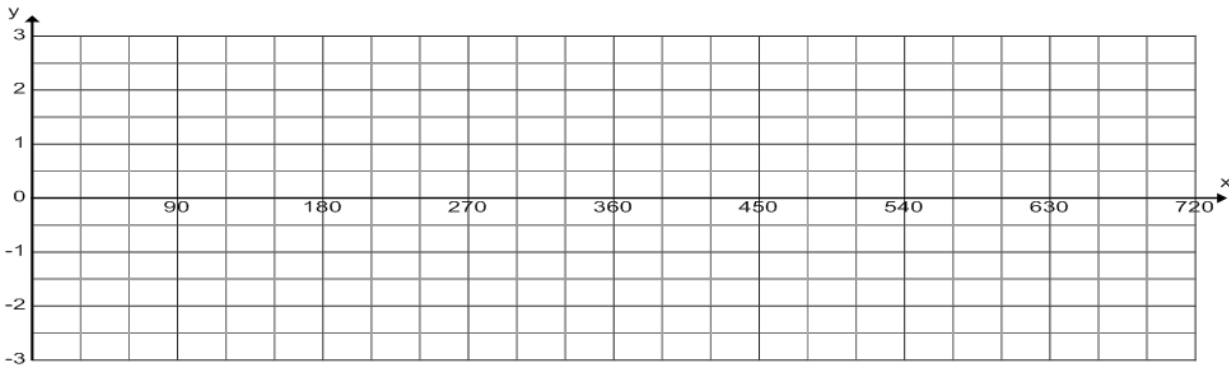**d)** For the function to give an accurate height, you must assume that the driver doesn't spin the wheels.
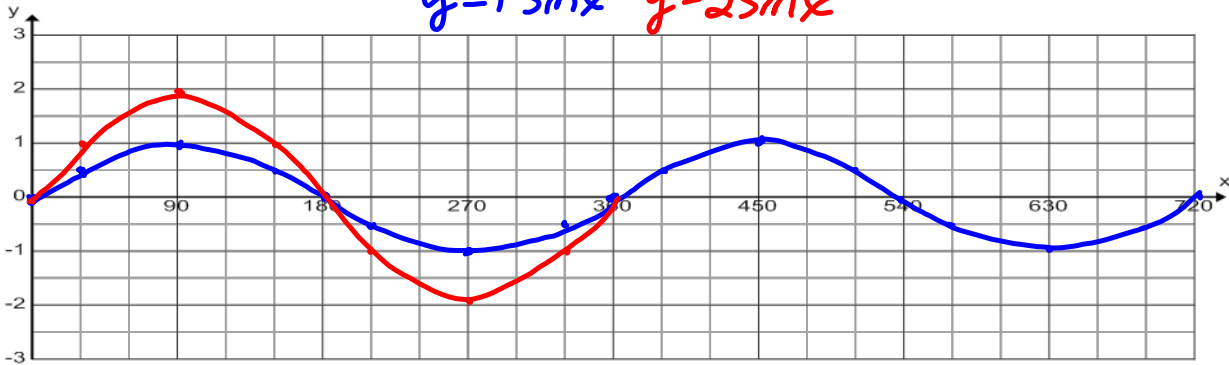
6.4 Exploring Transformations of Sinusoidal Functions
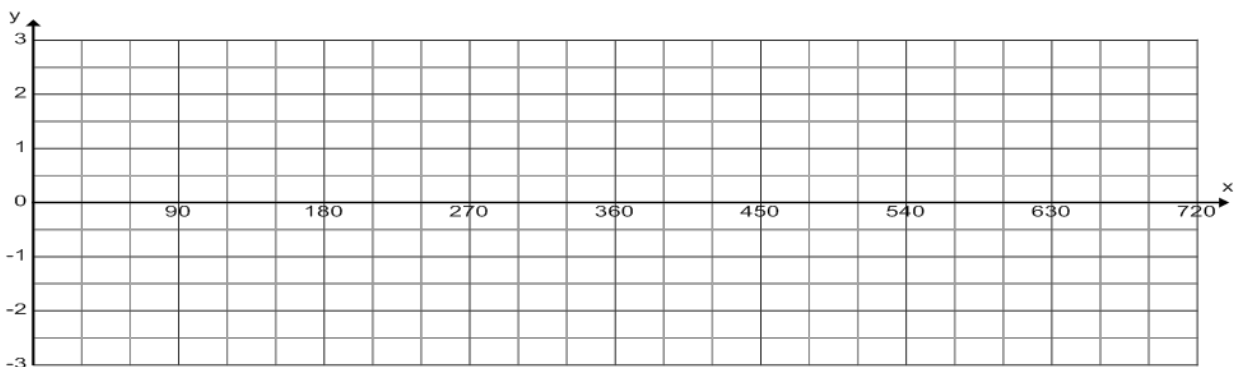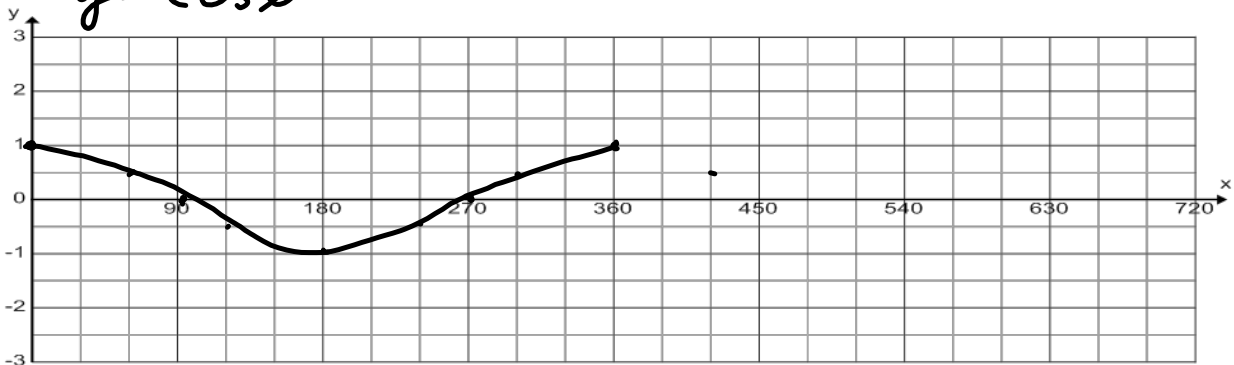
Date: Dec. 4/15

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

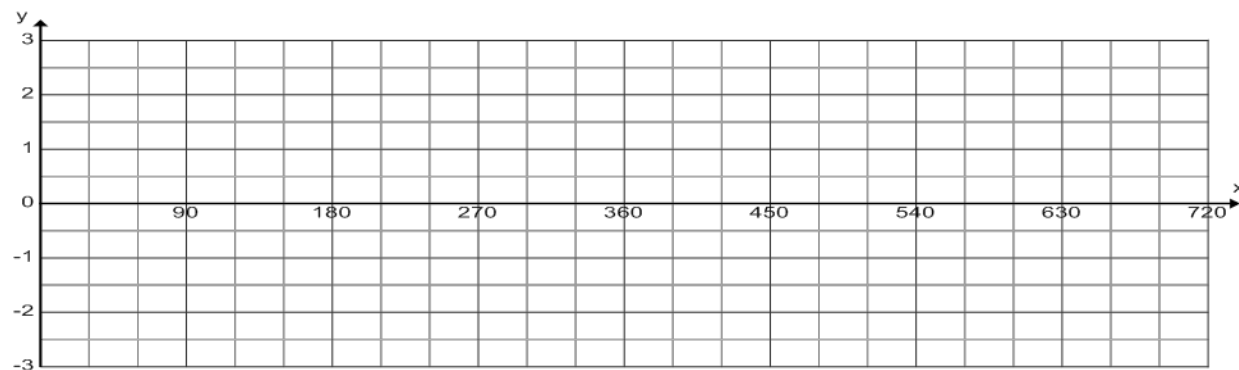Part 1: The Graphs of $y = a \sin x$ and $y = a \cos x$.

y=1 Sinx   y=2sinx

y= cosx

3

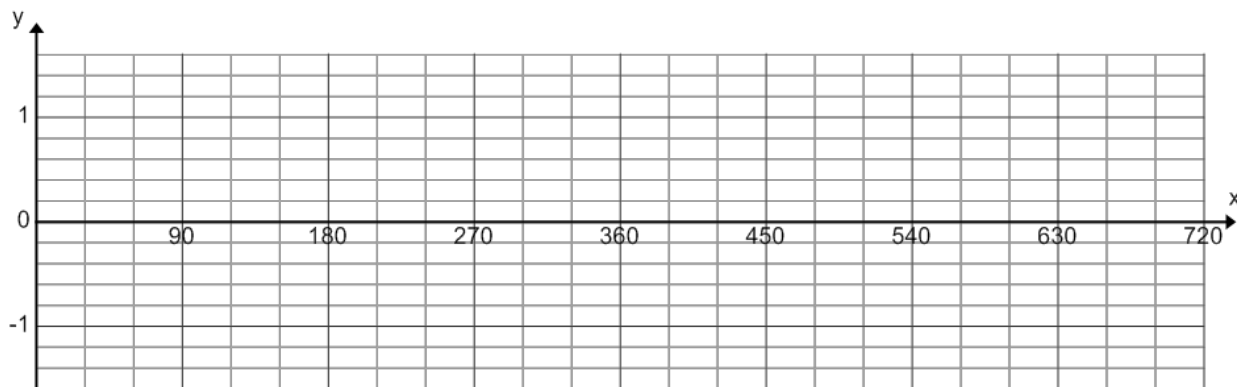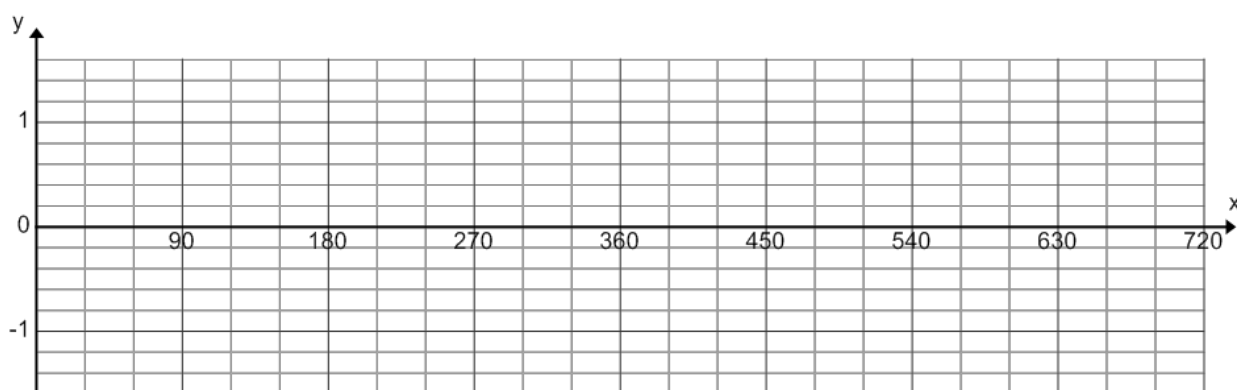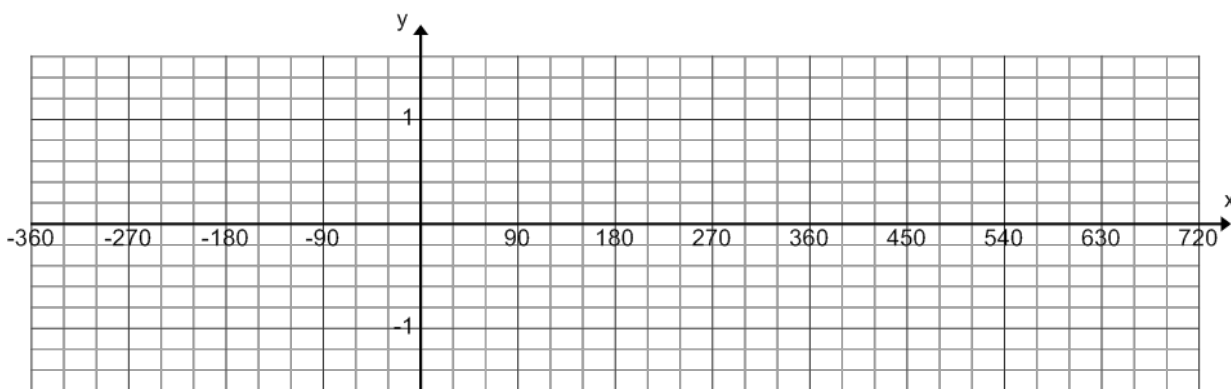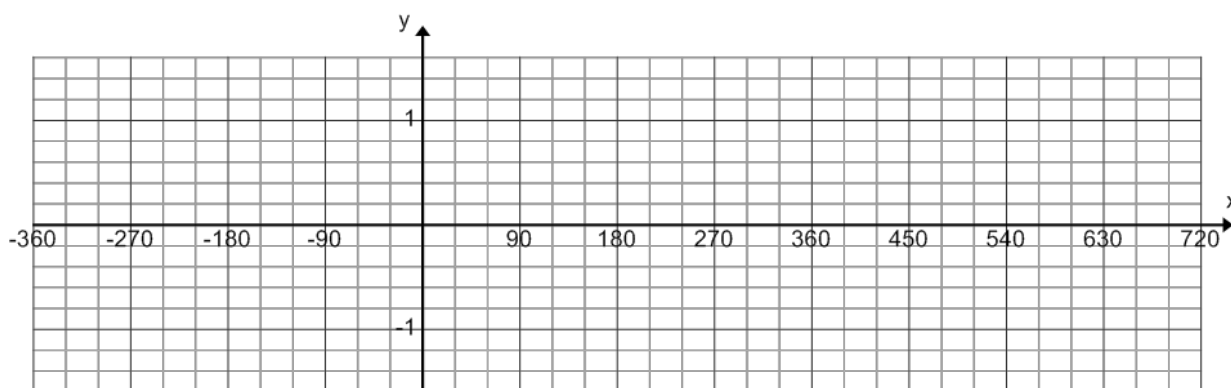Part 2: The Graphs of $y = \sin x + c$ and $y = \cos x + c$.
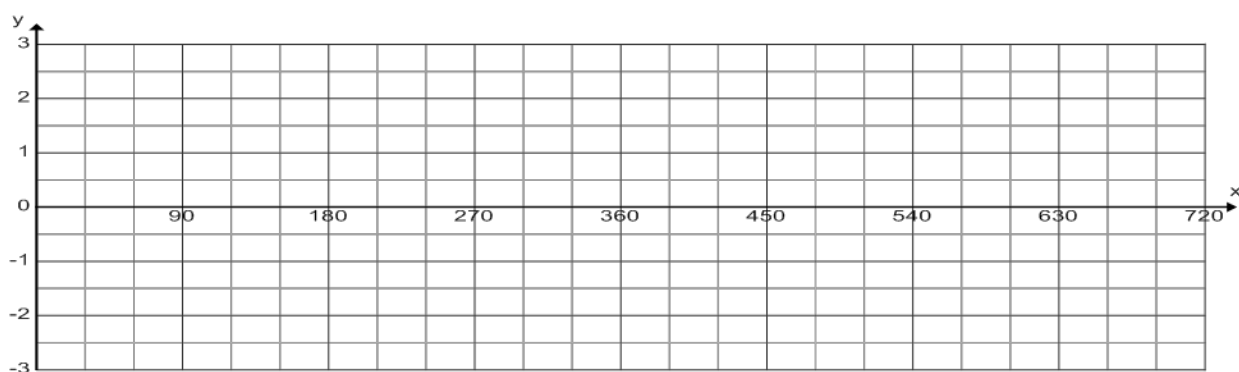
Part 3: The Graphs of $y = \sin kx$ and $y = \cos kx$.

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

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

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: p. 363 #8

pp. 370-372 #1 – 8, 13 [15]

Today's Homework Practice includes:

pp. 377-378 A – U

p. 379 #1 – 3

Attachments

6.2 SineTracer.gsp