Are there any questions from last day's assigned work you would like to see on the board?

pp. 330-332 # 1 – 3, 5 – 7 *(Use next screen?)*

2, 3, 5d

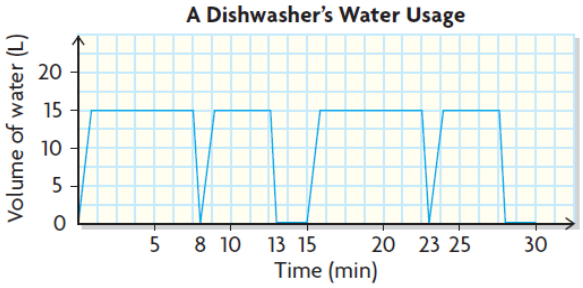
Today's Learning Goal(s):

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

a) Identify a specific type of periodic function called a sinusoidal function.
b) State the equation of the axis, given a sinusoidal curve.
c) State the period of a sinusoidal curve.
d) State the max/min value for the peaks & troughs.

p. 330

5. The graph shows the amount of water used by an automatic dishwasher as a function of time.



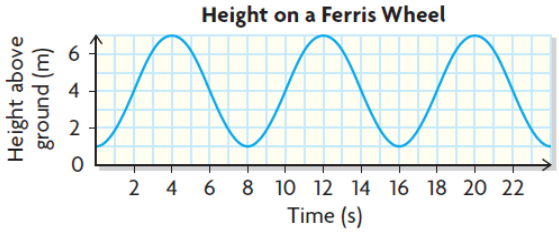
water for 1 cycle
= 30 L

a) Why does the operation of the dishwasher model a periodic function?
b) What is the period? What does one complete cycle mean?
c) Extend the graph for one more complete cycle.
d) How much water is used if the dishwasher runs through eight complete cycles?
e) For part (d), state the domain and range of the function.

15 min
→ 8 x 30
= 240 L

6. This is a graph of Nali's height above the ground in terms of time while riding a Ferris wheel.

A



a) What is the period of this function?
b) What does the period represent?
c) What is the diameter of the Ferris wheel? How do you know?
d) Approximately how high above the ground is Nali at 10 s?
e) At what times is Nali at the top of the wheel?
f) When is Nali 4 m above the ground?

This is NOT on the handout, but needs to be understood.

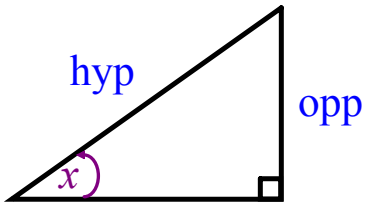
Defining an angle in "standard position".

θ = Principal Angle

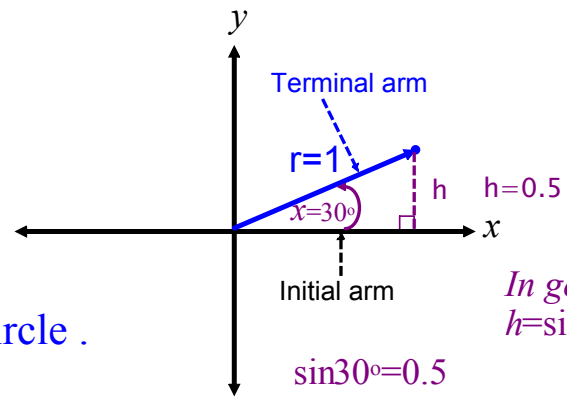
θ = x degrees measured ***counter***-clockwise

Explain: $0^o \le \theta \le 360^o$

[or $0^o \le x \le 360^o$**]**



$$\sin x = \frac{opp}{hyp}$$



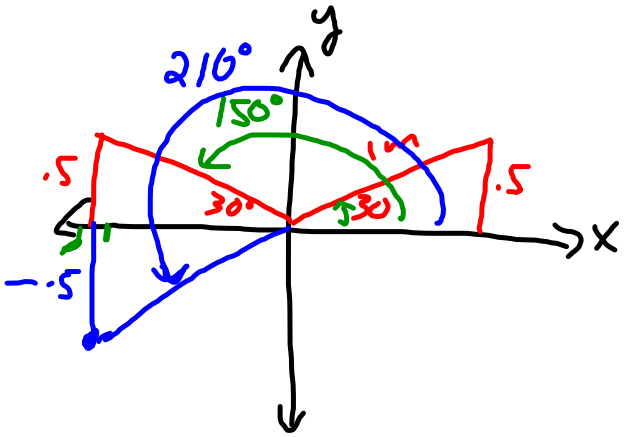
In general, $h=\sin x$

Let's use a radius of **1** unit for our circle .

$$\sin x = \frac{opp}{1}$$

$\sin x = opp$ (height of the opposite side)

$\sin 30^o = 0.5$



MCF 3MI

6.3 Investigating the Sine Function, $y = \sin x$

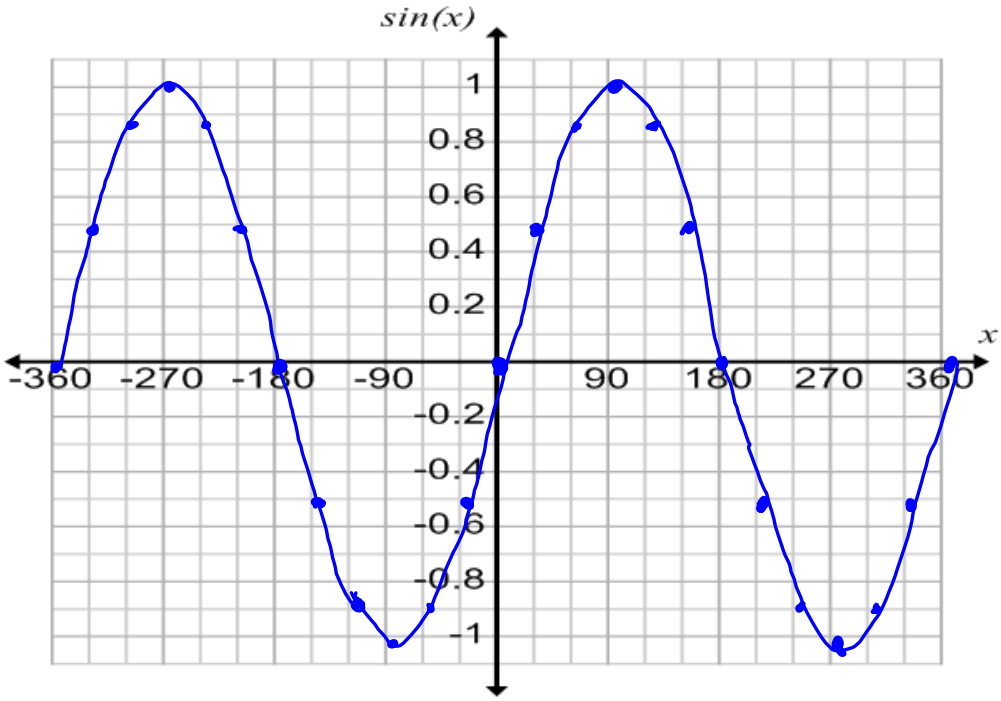
Date: NOV. 20/19

Ex.1: Complete the following table of values. (Round to 2 decimal places)

x	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
$\sin(x)$	0	0.5	0.866 0.87	1	0.87	0.5	0	-0.5	-0.87	-1	-0.87	-0.5	0

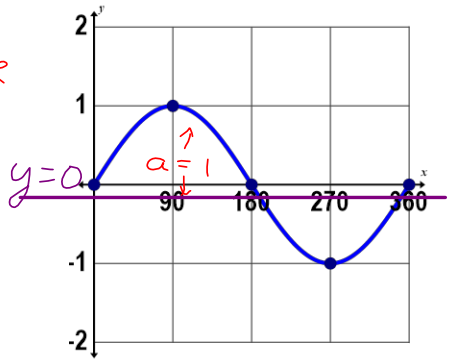
x	-360°	-330°	-300°	-270°	-240°	-210°	-180°	-150°	-120°	-90°	-60°	-30°
$\sin(x)$	0	0.5	0.87	1	0.87	0.5	0	-0.5	-0.87	-1	-0.87	-0.5

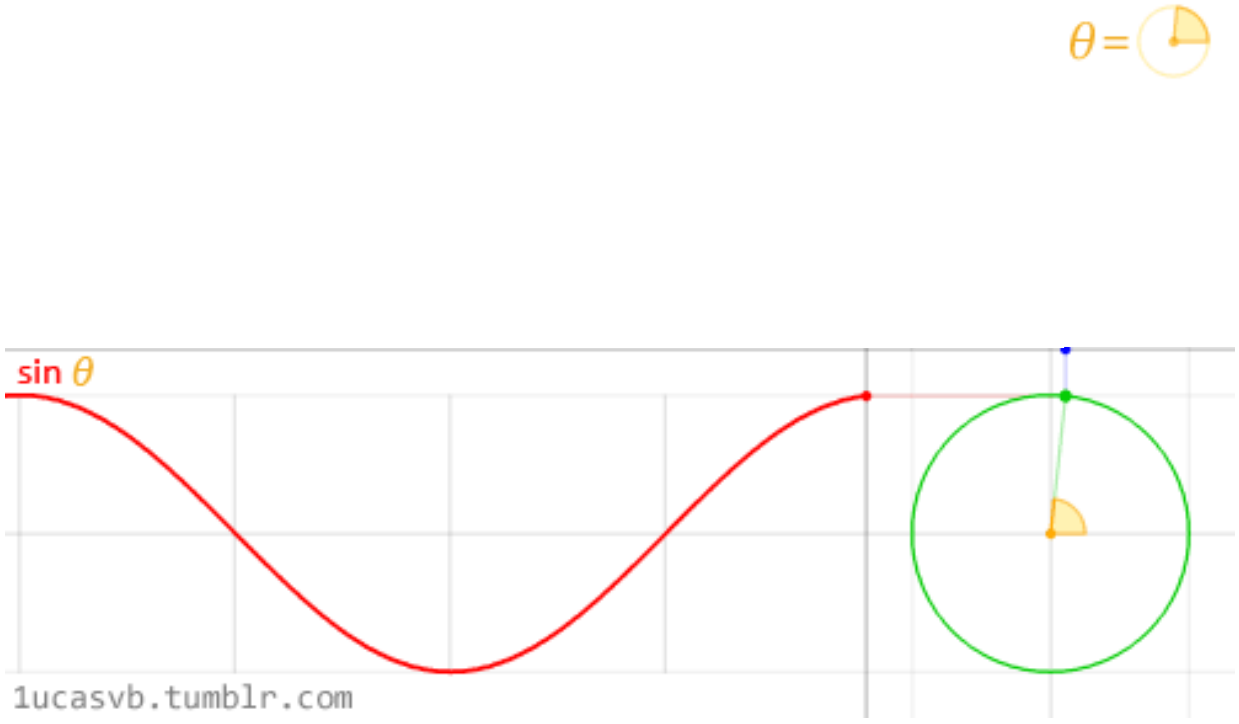
Sketch the curve using the table of values above.

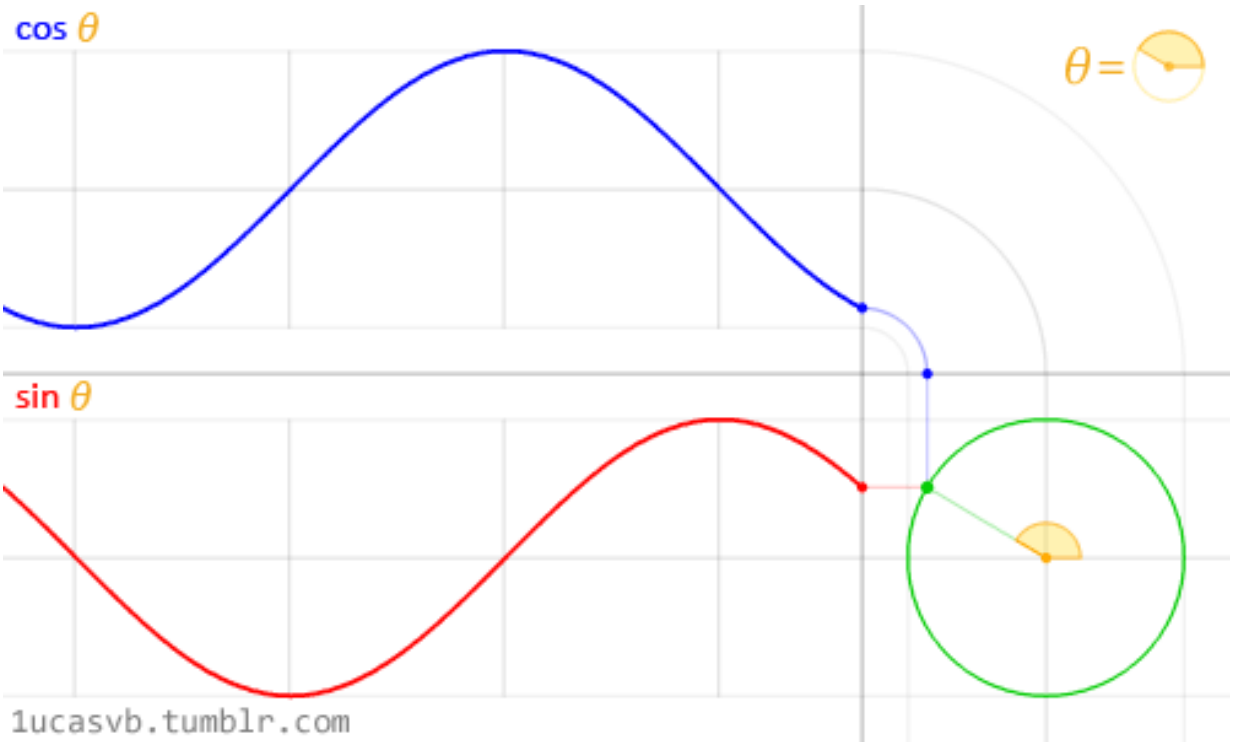


The ***Sine Function***, $y = \sin x$, has the following properties: y = sin x

- it has an amplitude of 1 *always positive
- it has a period of 360°
- The equation of the axis is defined by $y =$ 0
- the domain is D = {x∈R}
- the range is R = {y∈R | -1 ≤ y ≤ 1}
- key points: (0°, 0), (90°, 1), (180°, 0), (270°, -1), (360°, 0)




θ =
sin θ
1ucasvb.tumblr.com


cos θ
θ =
sin θ
1ucasvb.tumblr.com

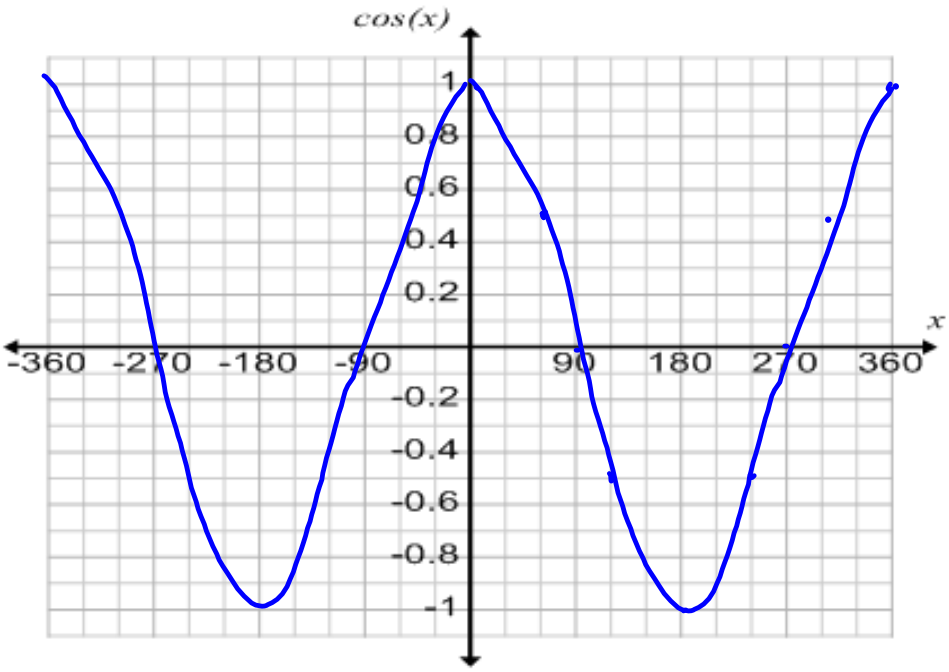
Another Sinusoidal Function, $y = \cos x$

Ex.2: Complete the following table of values. (Round to 2 decimal places)

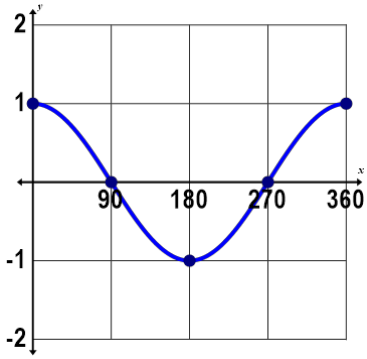
x	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
$\cos(x)$													

x	-360°	-330°	-300°	-270°	-240°	-210°	-180°	-150°	-120°	-90°	-60°	-30°
$\cos(x)$												

Sketch the curve using the table of values above.



The ***Cosine Function***, $y = \cos x$, has the following properties: $y = \cos x$



- it has an amplitude of 1
- it has a period of 360°
- its axis is defined by $y =$ 0
- the domain is D = $\{x \in \mathbb{R}\}$
- the range is R = $\{y \in \mathbb{R} \mid -1 \leq y \leq 1\}$
- key points: (0°, 1), (90°, 0), (180°, -1), (270°, 0), (360°, 1)

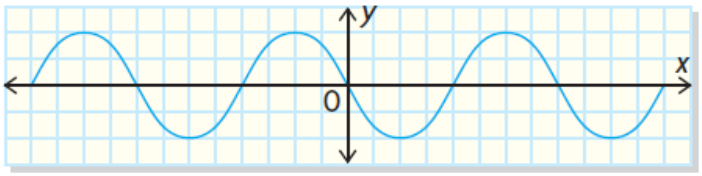
Today's Homework: Do p. 339 # 1 (*together in class*)
pp. 339-343 # 2 – 4, 6, 9, 12

Today's Homework:

Do p. 339 # 1 (*together in class*) **AND**
READ pp. 337-339 **AND**
pp. 339-343 # 2 – 4, 6, 9, 12

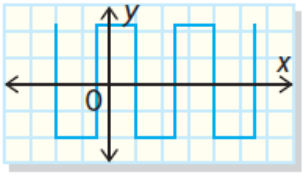
p. 339 **1.** Which graphs are sinusoidal functions? Justify your decision.

a)



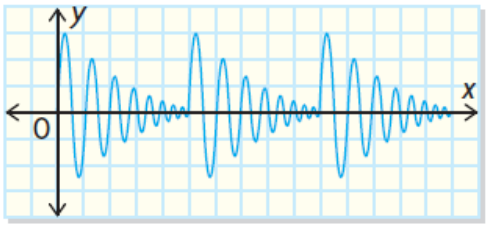
Yes

b)



Not Sinusoidal

c)



Not Sinusoidal