

What's Going On?

Checking In

Minds on

Making the Graph

Action!

Bike Tires and Table Saws

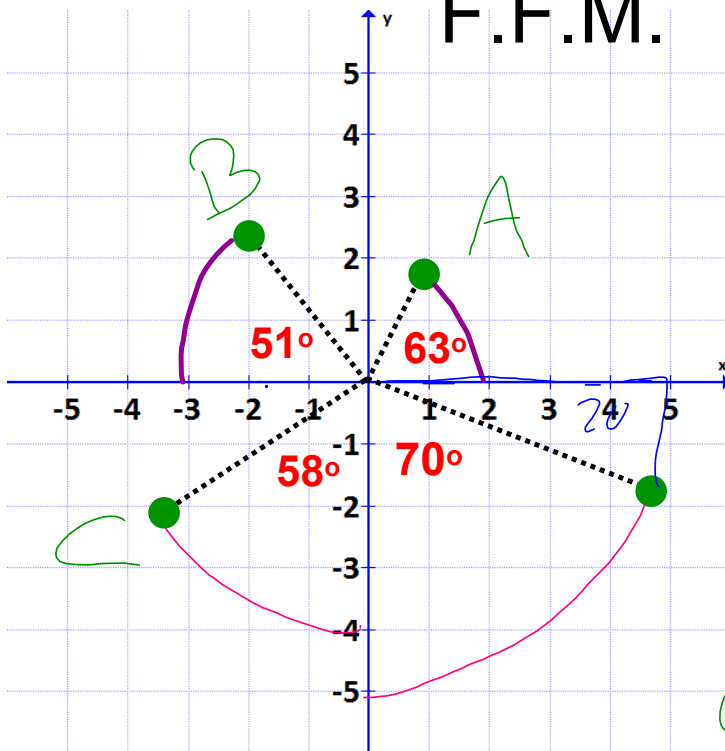
Consolidation

Your Turn!

Learning Goal - I will be able to interpret the real-life significance of sinusoidal functions.

Checking In

F.F.M.



Find the exact and approximate coordinates of each point.

$$A = (2 \cos 63^\circ, 2 \sin 63^\circ) \\ = (0.91, 1.78)$$

$$B = (3 \cos 129^\circ, 3 \sin 129^\circ) \\ = (-1.98, 2.33)$$

$$C = (4 \cos 212^\circ, 4 \sin 212^\circ) \\ = (-3.39, -2.12)$$

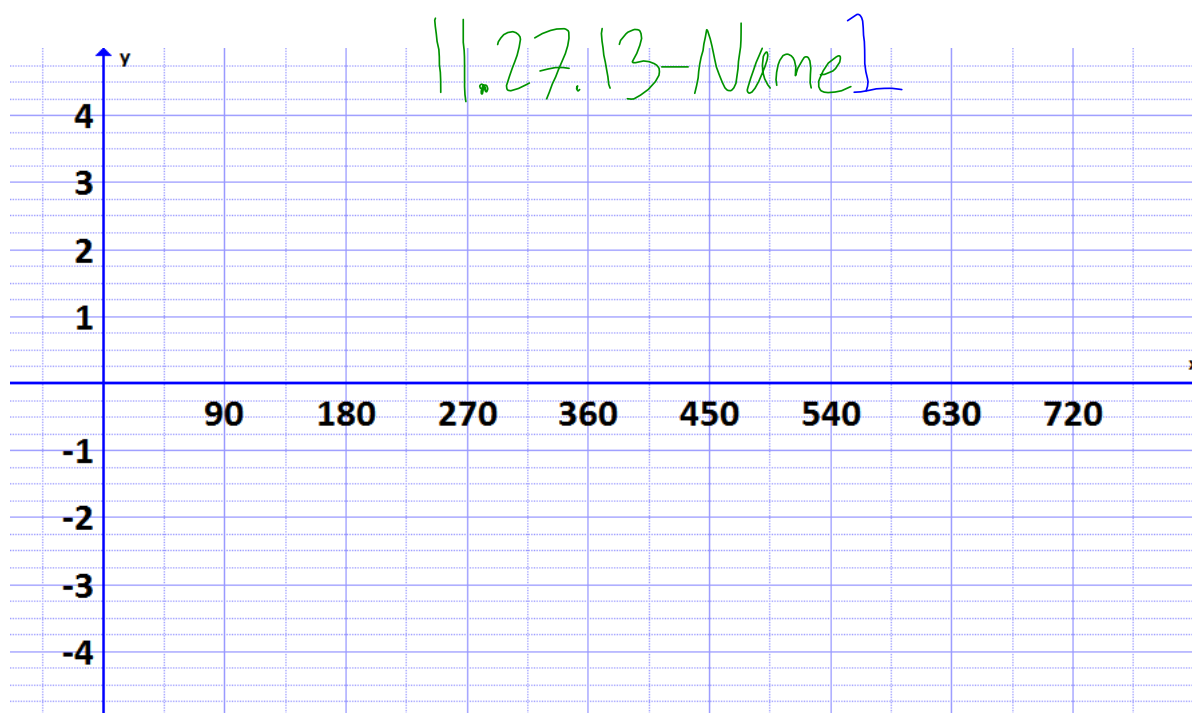
$$D = (5 \cos 340^\circ, 5 \sin 340^\circ) \\ = (4.70, -1.71)$$

**SHOW YOUR
WORK!**

Minds on

Making the Graph

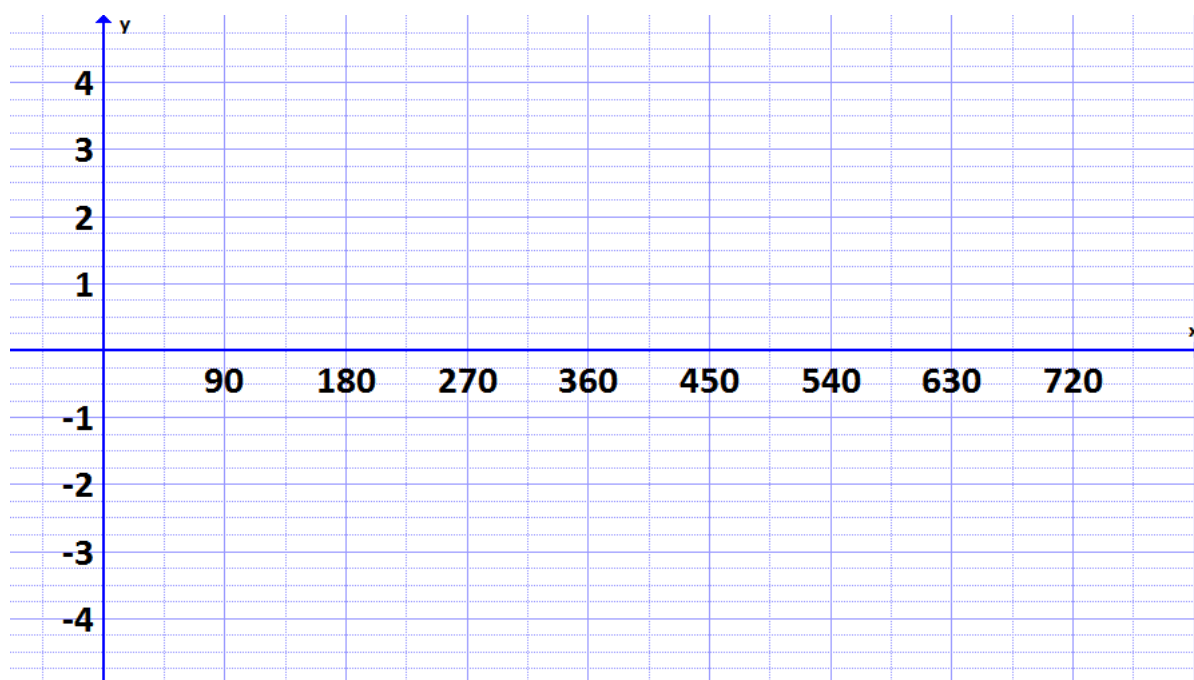
Sketch a graph of a periodic (non-sinusoidal) function with an amplitude of 2, a period of 270 degrees and whose axis equation is $y = -1$.



Minds on

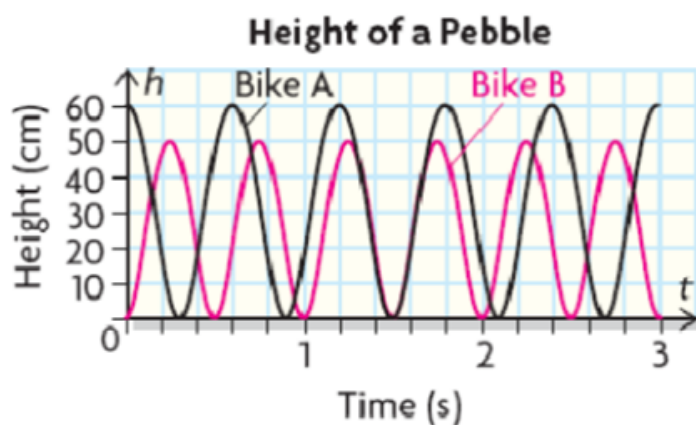
Making the Graph

Sketch a graph of a sinusoidal function with an amplitude of 2.5, a period of 360 degrees and whose axis equation is $y = 1.5$.



Action!

Sinusoidal Functions



Allan (Bike A) and Brian (Bike B) were out for a bike ride. Each of them got a pebble stuck in their tire.

The curves in the graph above show the height of the pebble above the ground over time.



1. What is the diameter/radius of Allan's wheel?

60cm
30cm
amplitude

2. What is the diameter/radius of Brian's wheel?

50cm
25cm
amplitude

3. How high off the ground is the axle of Allan's wheel?

30cm (equation of axis)

4. How high off the ground is the axle of Brian's wheel?

25cm (equation of axis)

5. How long does it take Allan's wheel to complete one full revolution?

0.6s (period)

6. How long does it take Brian's wheel to complete one full revolution?

0.5s (period)



7. How far does Allan's bike travel after one rotation of the wheel?

$$C = 2\pi(30)$$

$$= 188.5 \text{ cm}$$

8. How far does Brian's bike travel after one rotation of the wheel?

$$C = 2\pi(25)$$

$$C = 157.1 \text{ cm}$$

9. Who is travelling at a faster speed?

$$s = \frac{d}{t}$$

$$\text{Allan: } \frac{188.5}{0.6} = 314.1$$

$$\text{Brian: } \frac{157.1}{0.5} = 314.1$$

10. Revisit questions 1-6 and identify which unit term each question is addressing.

$$\frac{2\pi(30)}{0.6}$$

$$\frac{60\pi}{0.6}$$

$$100\pi$$

$$\frac{2\pi(25)}{0.5}$$

$$\frac{50\pi}{0.5}$$

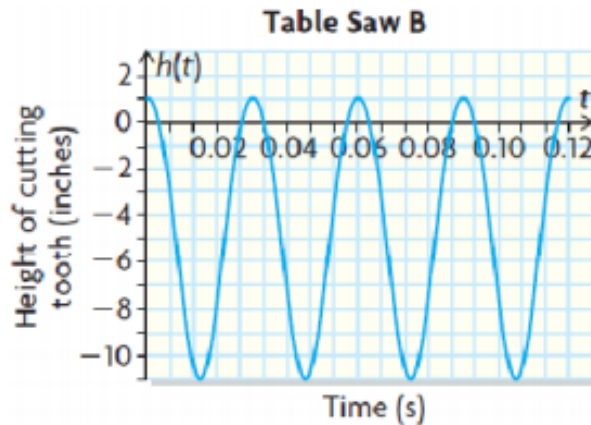
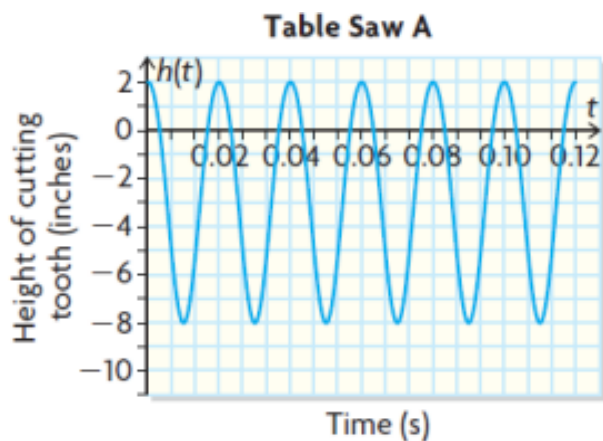
$$100\pi$$

Action!

Table Saws

Below are graphs describing the motion of two different table saws.

What information can you gather from the graphs?



Consolidation

Your Turn!

Sketch graphs of two sinusoidal scenarios and challenge someone else to describe what is happening.

Be sure to include proper axis labels and units!