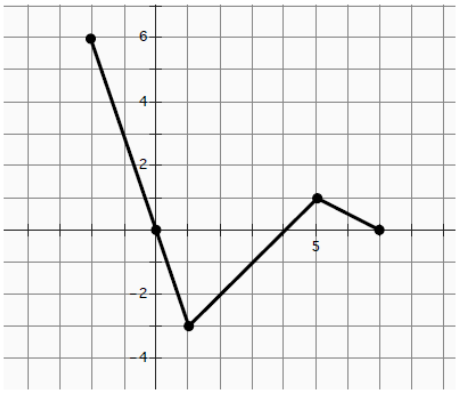
1.2 Do You Know "Sine" Language?

Practice

I. Describing intervals of graphs

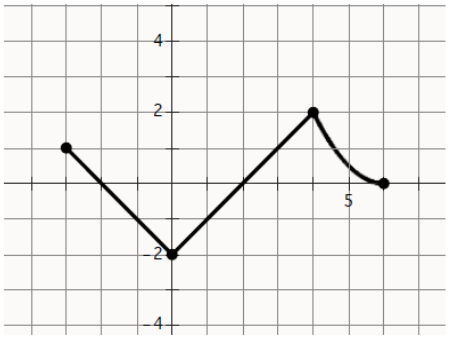
Write the intervals where the graph is positive and the intervals where the graph is negative.



1.

Positive:

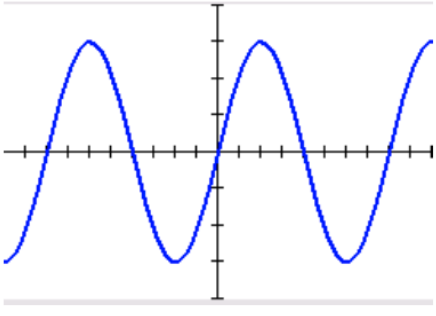
Negative:



2.

Positive:

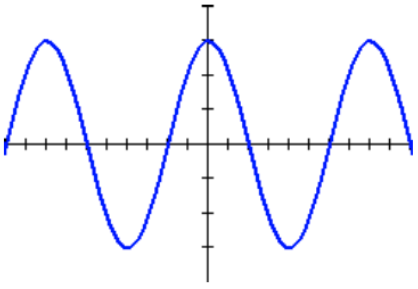
Negative:



3. (The scale on the x-axis is in 45° increments.)

Positive:

Negative:



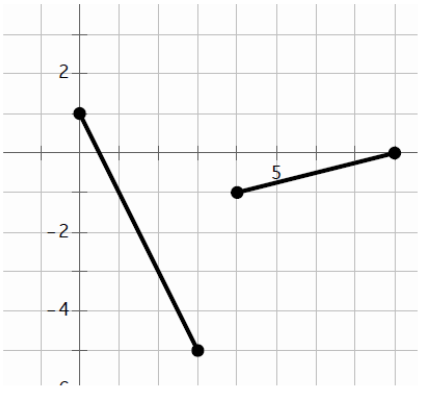
4. (The scale on the x-axis is in 45° increments.)

Positive:

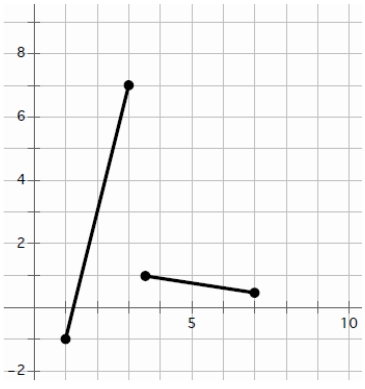
Negative:

Write the piece-wise equations for the given graphs.

5.



6.

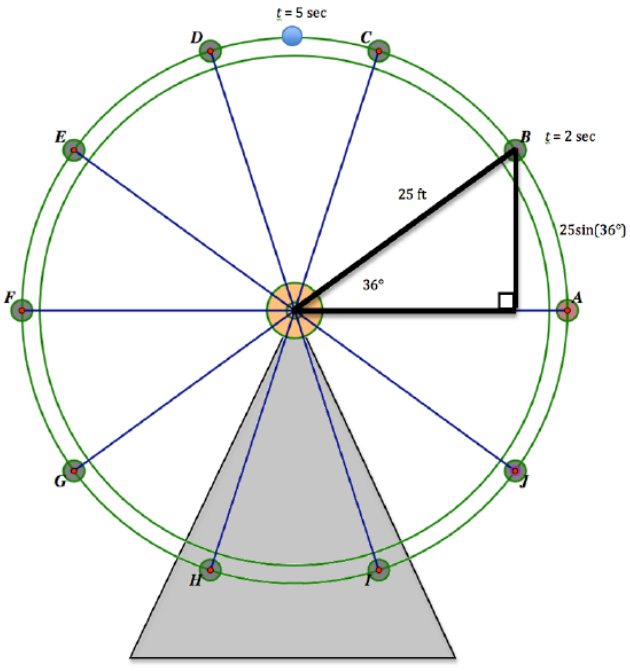


II. Sine as a function of time

Recall the following facts from the investigation:

- The Ferris wheel has a radius of 25 feet
- The center of the Ferris wheel is 30 feet above the ground

Due to a safety concern, the management of the amusement park decides to slow the rotation of the Ferris wheel from 20 seconds for a full rotation to **30 seconds for a full rotation**.



7. Calculate how high a rider will now be 2 seconds after passing position A on the diagram.

8. Calculate the height of a rider at each of the following times t, where t represents the number of seconds since the rider passed position A on the diagram. As you calculate each height, plot the position on the diagram. Connect the center of the circle to the point you plotted. Then draw a vertical line from the plotted point on the Ferris wheel to the line segment $\overline{AF}$ in the diagram. Each time you should get a right triangle similar to the one in the figure. (A large copy of the figure is on the last page.)

Elapsed time since passing position A	Calculations	Height of the rider
1 sec		
3 sec		
5 sec		
7 sec		
8 sec		
11 sec		
14 sec		
16 sec		
20 sec		
22 sec		

23 sec		
25 sec		
27 sec		
30 sec		

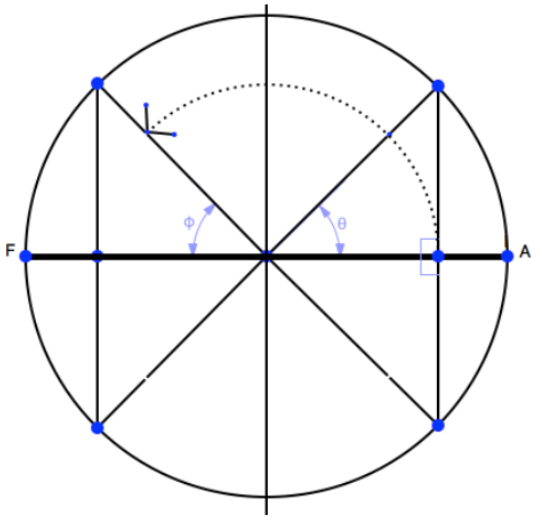
9. How did the position of the triangles you drew change between 5 seconds and 7 seconds?

10. How did the triangles you drew change between 14, 15, and 16 seconds?

11. How did the triangles you drew change between 22 seconds and 23 seconds?

12. Describe a relationship between the orientation of the right triangles around the circle and the angle of rotation. Use the diagram to help you think about the question.

(The dotted arc shows the angle of rotation.)



III. Finding missing angles in Triangles

Find the measure of each acute angle of right triangle ABC, with $m\angle C = 90°$.

Round your answers to the nearest degree.

Need help? Try this: https://www.khanacademy.org/math/geometry/hs-geo-trig/hs-geo-solve-for-an-angle/a/inverse-trig-functions-intro

13. $a = 3$ in; $c = 5$ in

14. $a = 5$ ft; $c = 10$ ft

15. $a = 9.1$ in; $c = 12.3$ in

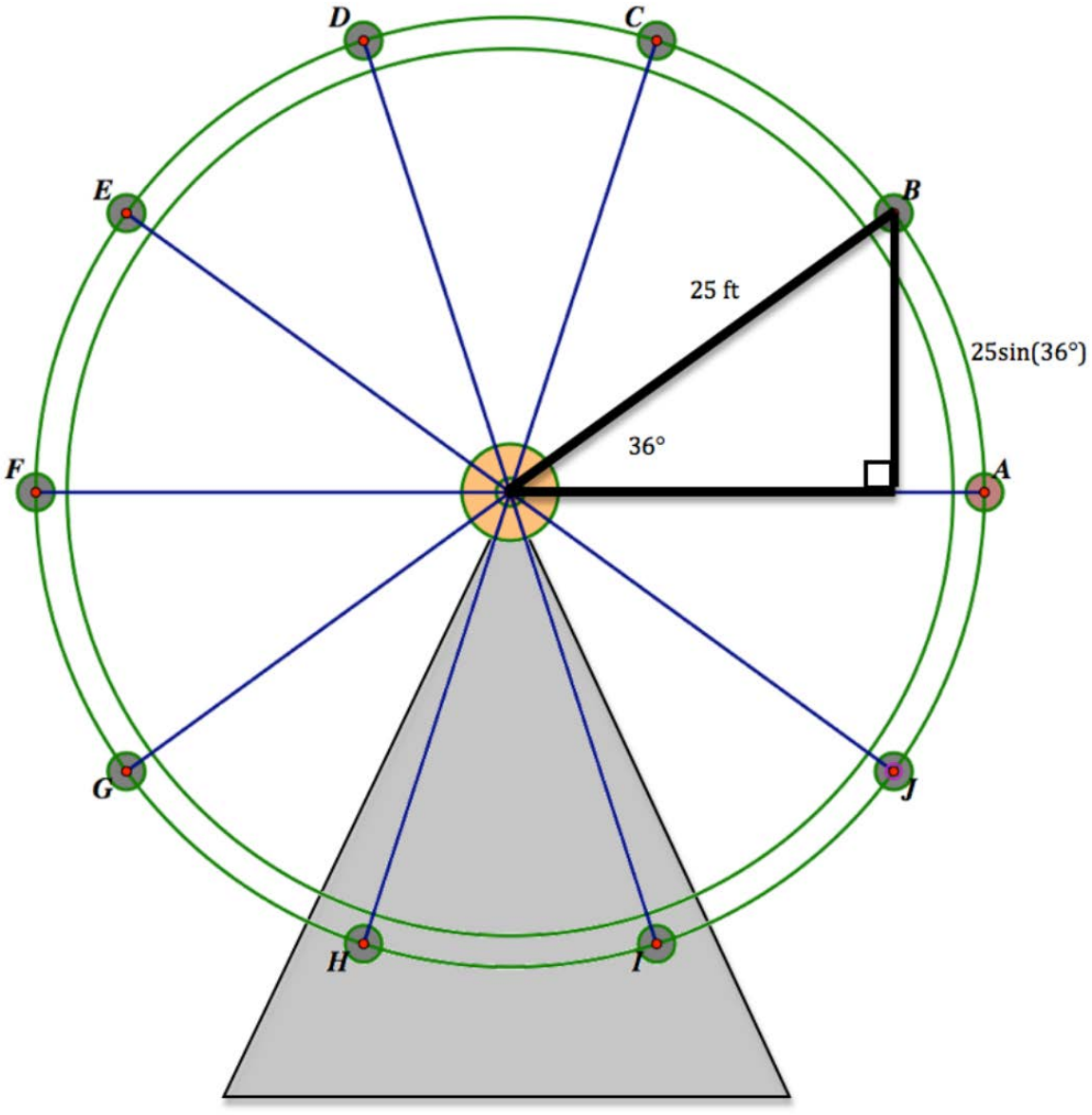
16. $a = 14.1$ cm; $c = 18$ cm

17. $a = 9.7$ in; $b = 12.7$ in

18. $a = 14.6$ ft; $c = 20.3$ ft

IV. Assessment – Khan Academy

1. Complete the following online worksheet in the Functions unit of Khan Academy's Geometry course: https://www.khanacademy.org/math/geometry/hs-geo-trig/hs-geo-solve-for-an-angle/e/solve-for-an-angle-in-a-right-triangle


D
C
E
B
25 ft
25sin(36°)
36°
F
A
G
J
H
I