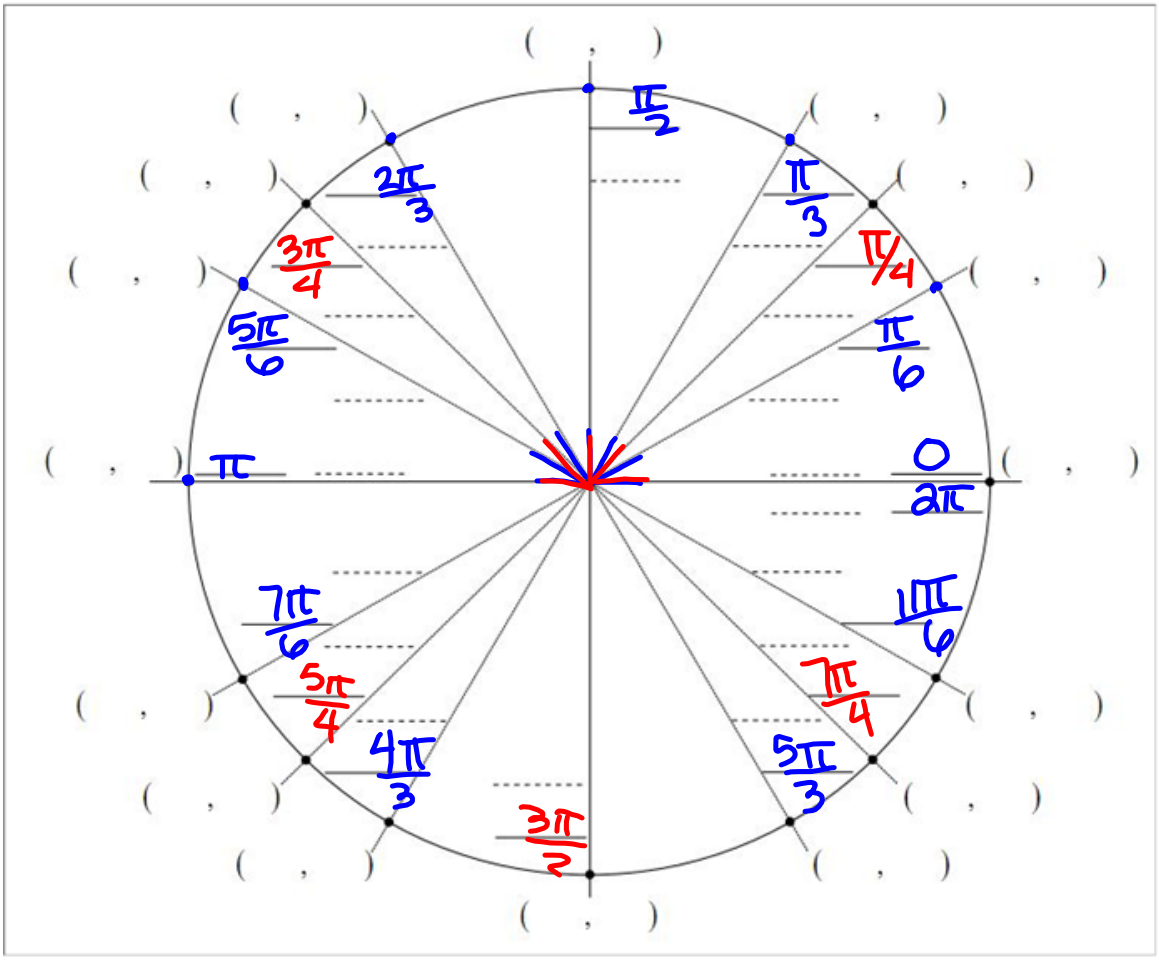
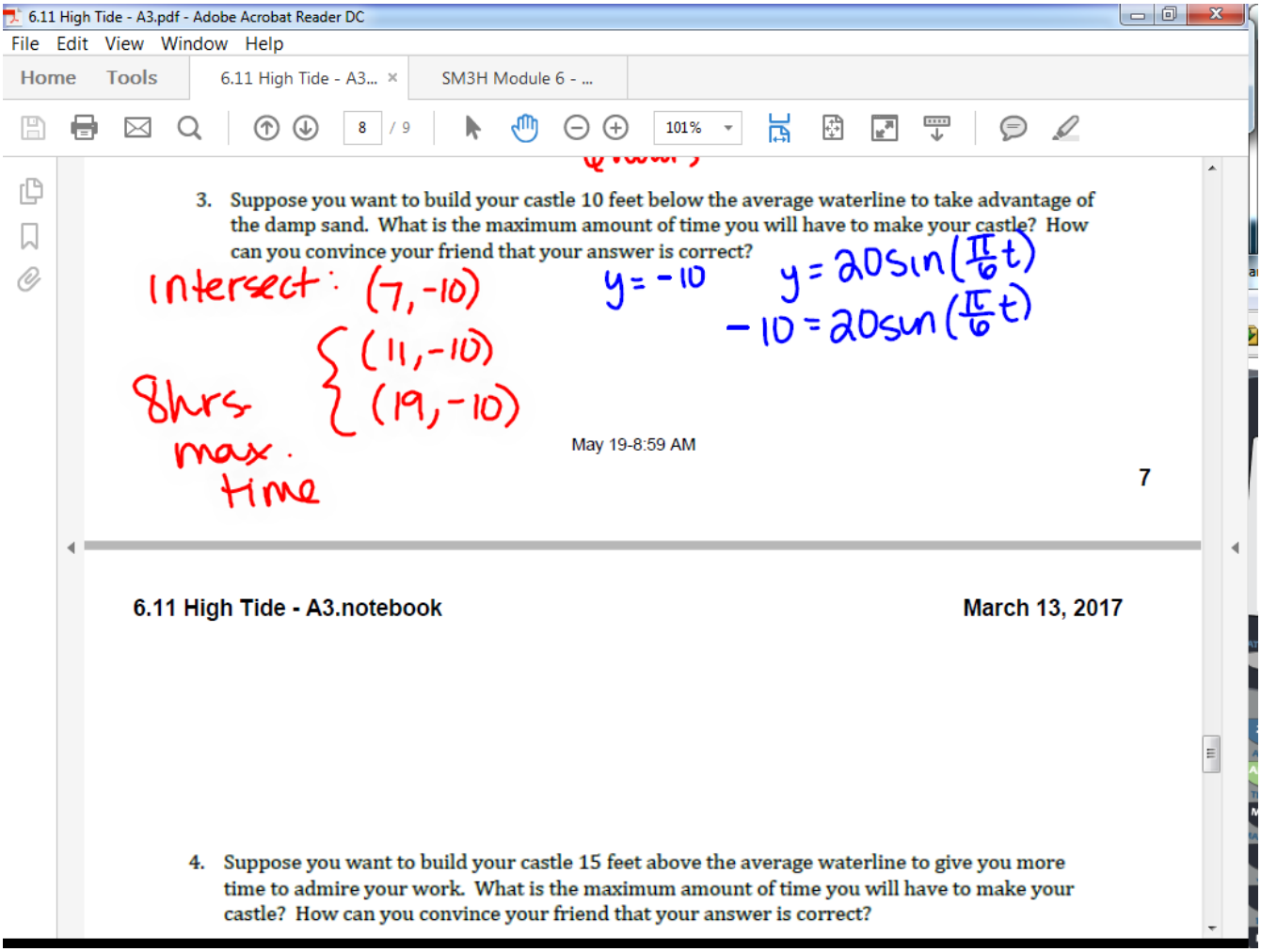
Questions on 6.11 HW?

Unit Circle Quiz Tuesday, practice with template below...



Mar 28-9:51 AM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8 / 9
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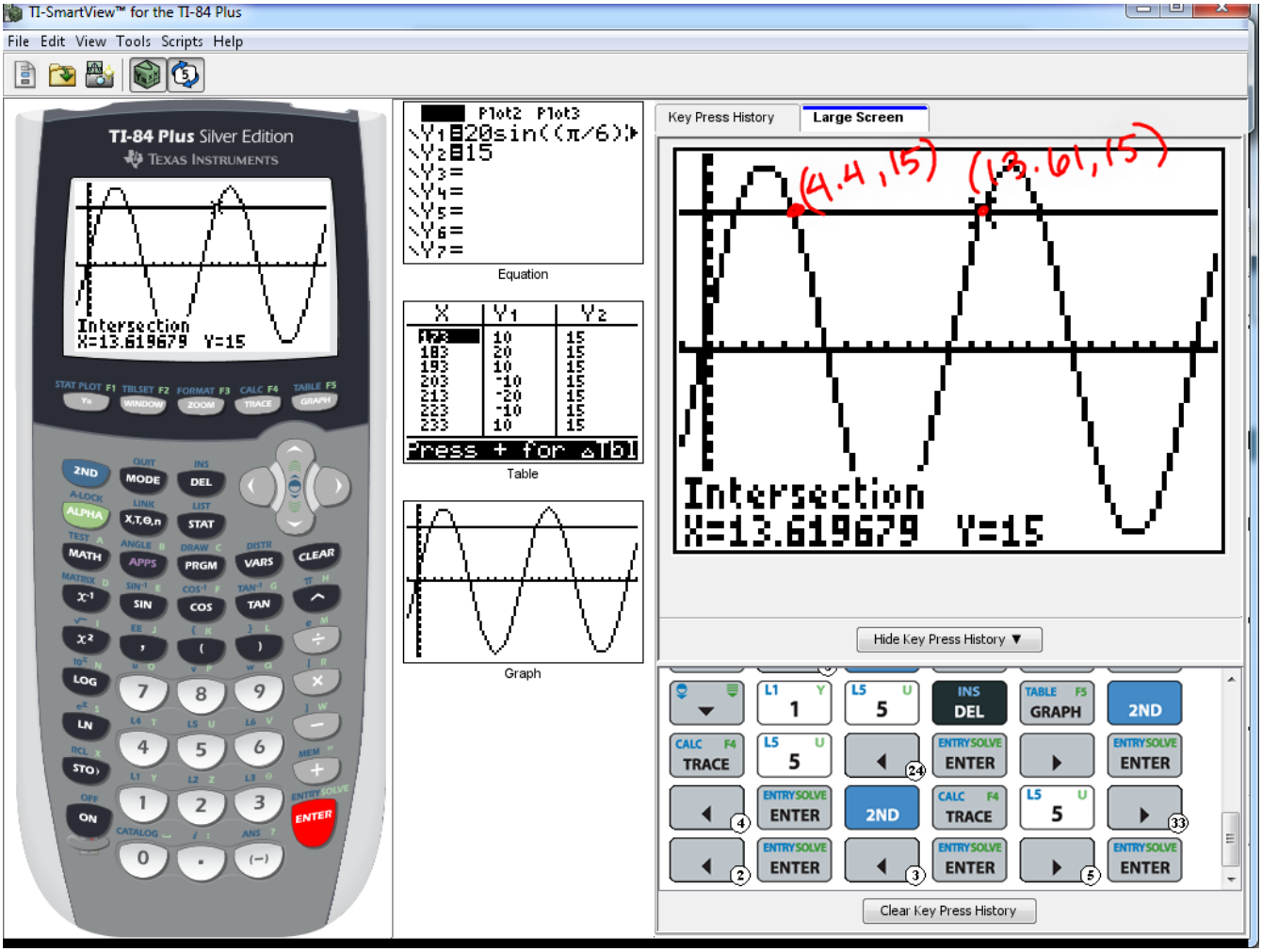
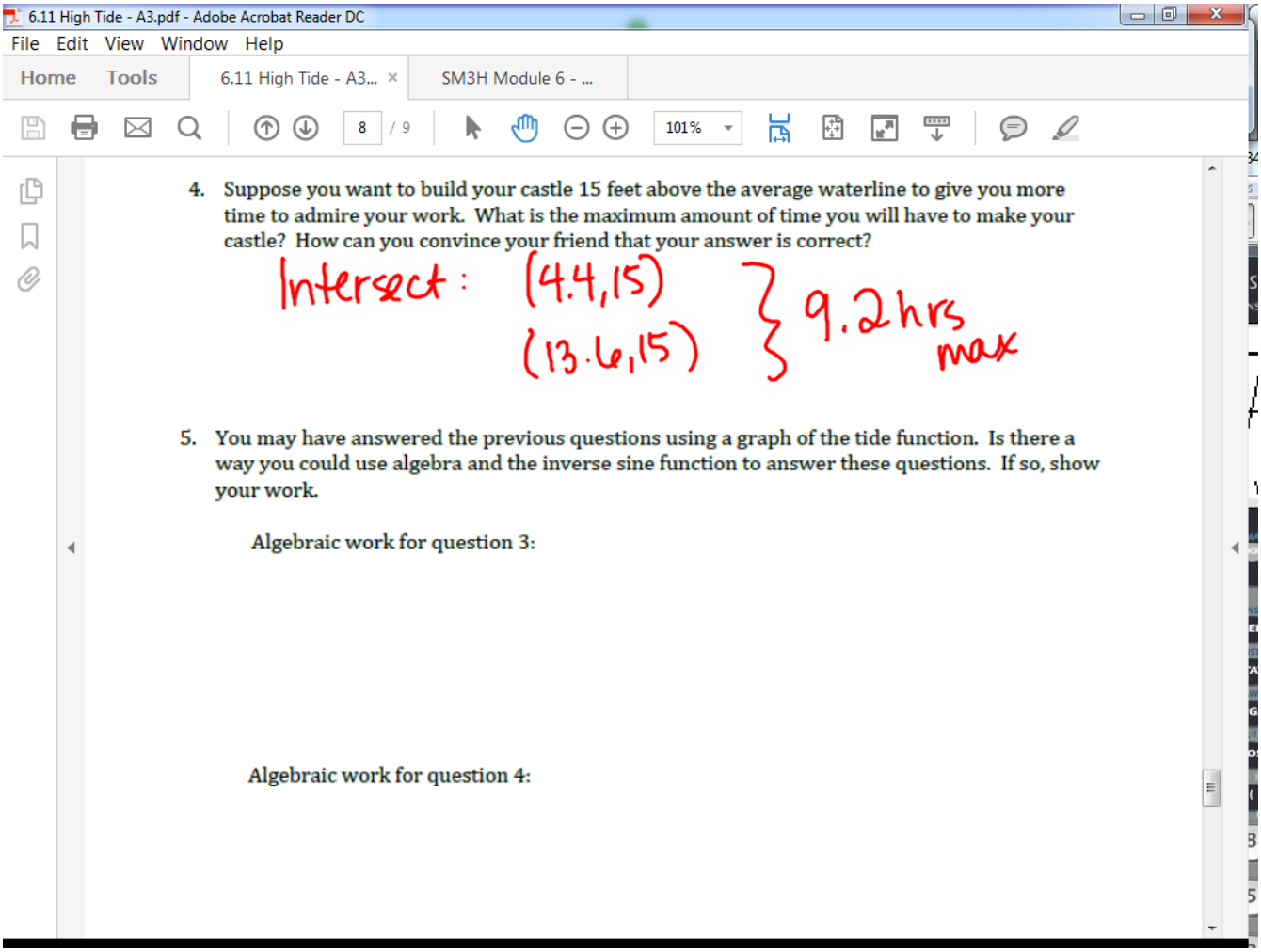
3. Suppose you want to build your castle 10 feet below the average waterline to take advantage of the damp sand. What is the maximum amount of time you will have to make your castle? How can you convince your friend that your answer is correct?
intersect: (7,-10)
(11,-10)
(19,-10)
8hrs
max. time
y = -10
y = 20sin(π/6 t)
-10 = 20sin(π/6 t)
May 19-8:59 AM
7
6.11 High Tide - A3.notebook March 13, 2017
4. Suppose you want to build your castle 15 feet above the average waterline to give you more time to admire your work. What is the maximum amount of time you will have to make your castle? How can you convince your friend that your answer is correct?


TI-SmartView™ for the TI-84 Plus
File Edit View Tools Scripts Help
TI-84 Plus Silver Edition
Texas Instruments
Intersection
X=13.619679 Y=15
Plot1 Plot2 Plot3
\Y1=20sin((π/6)X
\Y2=15
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
Equation
X Y1 Y2
10 15
13 20 15
16 10 15
19 -10 15
22 -20 15
25 -10 15
28 10 15
Press + for ΔTbl
Table
Graph
Key Press History
Large Screen
(4.4,15)
(13.61,15)
Intersection
X=13.619679 Y=15
Hide Key Press History
Clear Key Press History

Mar 15-9:48 AM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4. Suppose you want to build your castle 15 feet above the average waterline to give you more time to admire your work. What is the maximum amount of time you will have to make your castle? How can you convince your friend that your answer is correct?

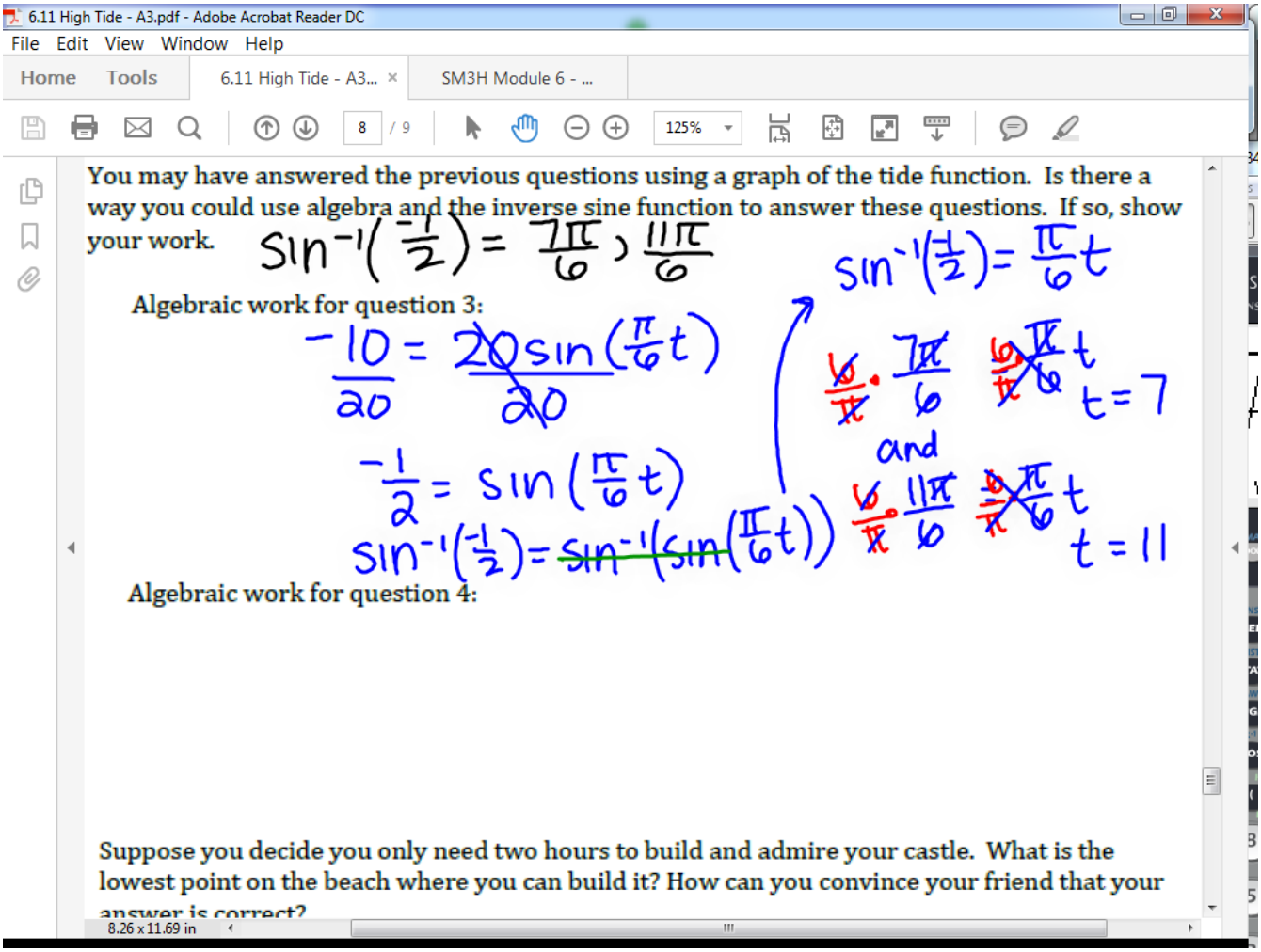
Intersect: (4.4, 15) (13.6, 15) } 9.2 hrs max

5. You may have answered the previous questions using a graph of the tide function. Is there a way you could use algebra and the inverse sine function to answer these questions. If so, show your work.

Algebraic work for question 3:

Algebraic work for question 4:

Mar 15-9:49 AM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8 / 9
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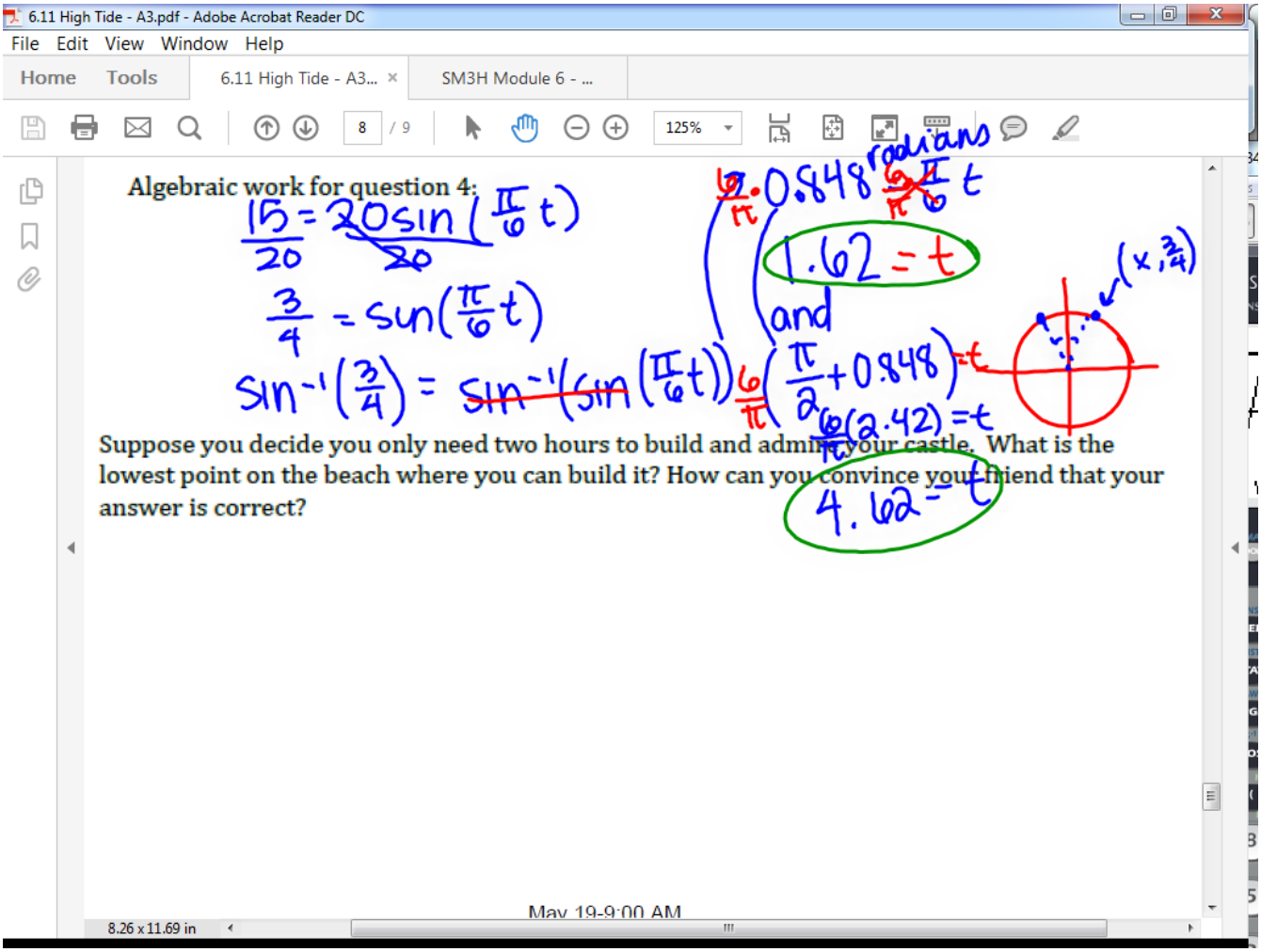
You may have answered the previous questions using a graph of the tide function. Is there a way you could use algebra and the inverse sine function to answer these questions. If so, show your work.
$\sin^{-1}\left(\frac{-1}{2}\right) = \frac{7\pi}{6}, \frac{11\pi}{6}$
Algebraic work for question 3:
$\frac{-10}{20} = \frac{20\sin\left(\frac{\pi}{6}t\right)}{20}$
$\frac{-1}{2} = \sin\left(\frac{\pi}{6}t\right)$
$\sin^{-1}\left(\frac{-1}{2}\right) = \sin^{-1}\left(\sin\left(\frac{\pi}{6}t\right)\right)$
$\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}t$
$\frac{6}{\pi} \cdot \frac{7\pi}{6} \quad \frac{6}{\pi}\frac{\pi}{6}t \quad t = 7$
and
$\frac{6}{\pi} \cdot \frac{11\pi}{6} \quad \frac{6}{\pi}\frac{\pi}{6}t \quad t = 11$
Algebraic work for question 4:
Suppose you decide you only need two hours to build and admire your castle. What is the lowest point on the beach where you can build it? How can you convince your friend that your answer is correct?
8.26 x 11.69 in



Mar 15-10:10 AM

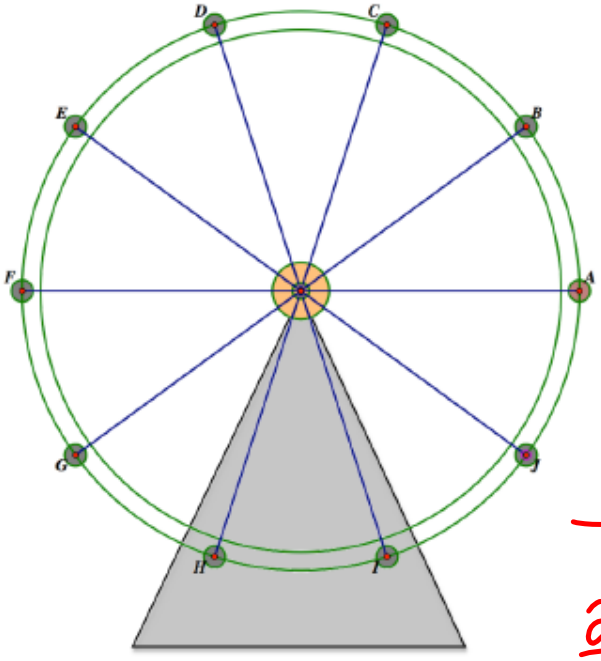
6.12 Getting on the Right Wavelength

A Practice Understanding Task

The Ferris wheel in the following diagram has a radius of 40 feet, its center is 50 feet from the ground, and it makes one revolution counterclockwise every 18 seconds.

Before: $h(t) = 30 + 25\sin\left(\frac{\pi}{10}t\right)$

$b = \frac{2\pi}{18} = \pi/9$



1. Write the equation of the height of the rider at any time t, if at $t = 0$ the rider is at position A (Use radians to measure the angles of rotation).

$h(t) = 50 + 40\sin\left(\frac{\pi t}{9}\right)$

2. At what time(s) is the rider 70 feet above the ground? Show the details of how you answered this question.

$70 = 50 + 40\sin\left(\frac{\pi}{9}t\right)$

$\frac{20}{40} = \sin\left(\frac{\pi}{9}t\right)$

$\frac{1}{2} = \sin\left(\frac{\pi}{9}t\right)$

$\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{9}t$

$\frac{9}{\pi}\cdot\frac{\pi}{6} = \frac{9\pi}{\pi 9}t$

$\frac{9}{\pi}\cdot\frac{5\pi}{6} = \frac{9\pi}{\pi 9}t$

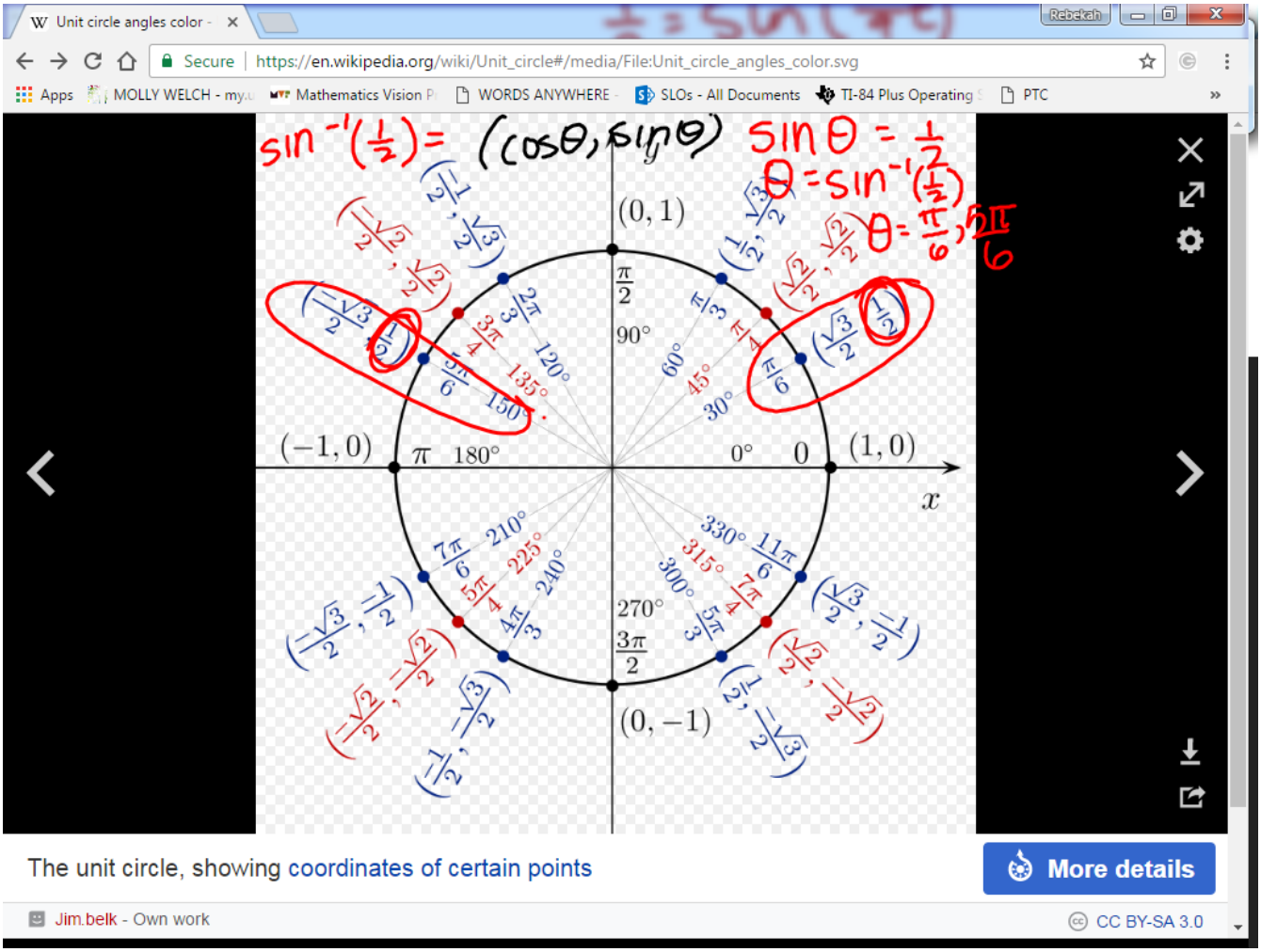
$1.5_{\text{sec}} = \frac{3}{2} = \frac{9}{6} = t$

$7.5_{\text{sec}} = \frac{15}{2} = \frac{45}{6} = t$

3. If you used a sine function in question 1, revise your equation to model the same motion with a cosine function. If you used a cosine function, revise your equation to model the motion with a sine function.

SKIP 4 TODAY

Mar 14-2:05 PM



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4. Write the equation of the height of the rider at any time t, if at $t = 0$ the rider is at position D (Use radians to measure the angles of rotation).

FINISH NOW OR FOR HW

5. For the equation you wrote in question 4, at what time(s) is the rider 80 feet above the ground? Show or explain the details of how you answered this question.

6. If you used a sine function in question 4, revise your equation to model the same motion with a cosine function. If you used a cosine function, revise your equation to model the motion with a sine function.

7. Choose any other starting position and write the equation of the height of the rider at any time t, if at $t = 0$ the rider is at the position you chose. (Use radians to measure the angles of rotation). Also change other features of the Ferris wheel, such as the height of the center, the radius, the direction of rotation and/or the length of time for a single rotation. (Record your equation and description of your Ferris wheel here.)

8. Trade the equation you wrote in question 7 with a partner and see if he or she can determine the essential features of your Ferris wheel: height of center, radius, period of revolution, direction of revolution, starting position of the rider. Resolve any issues where you and your partner have differences in your descriptions of the Ferris wheel modeled by your equation.

Homework

Finish 6.12 "Ready, Set, Go"