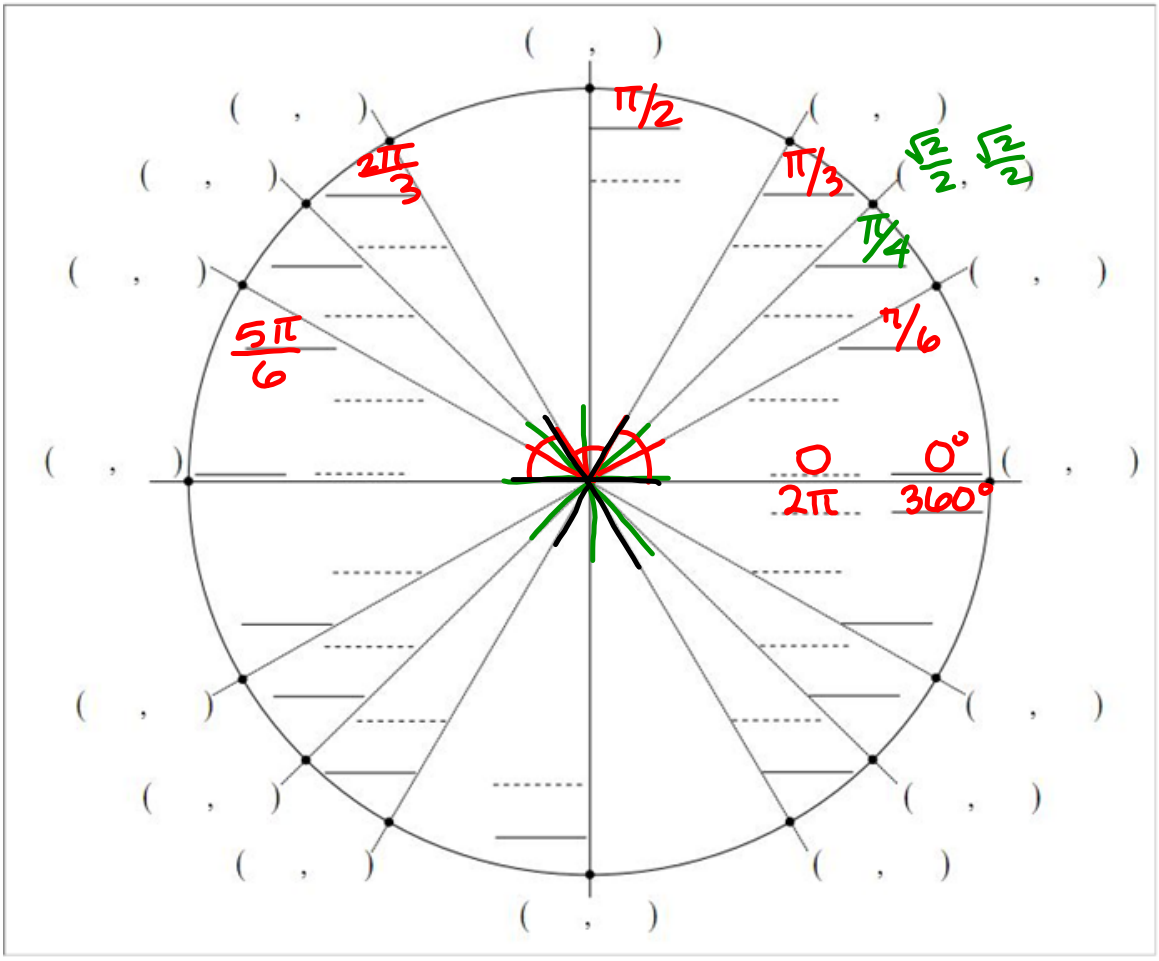
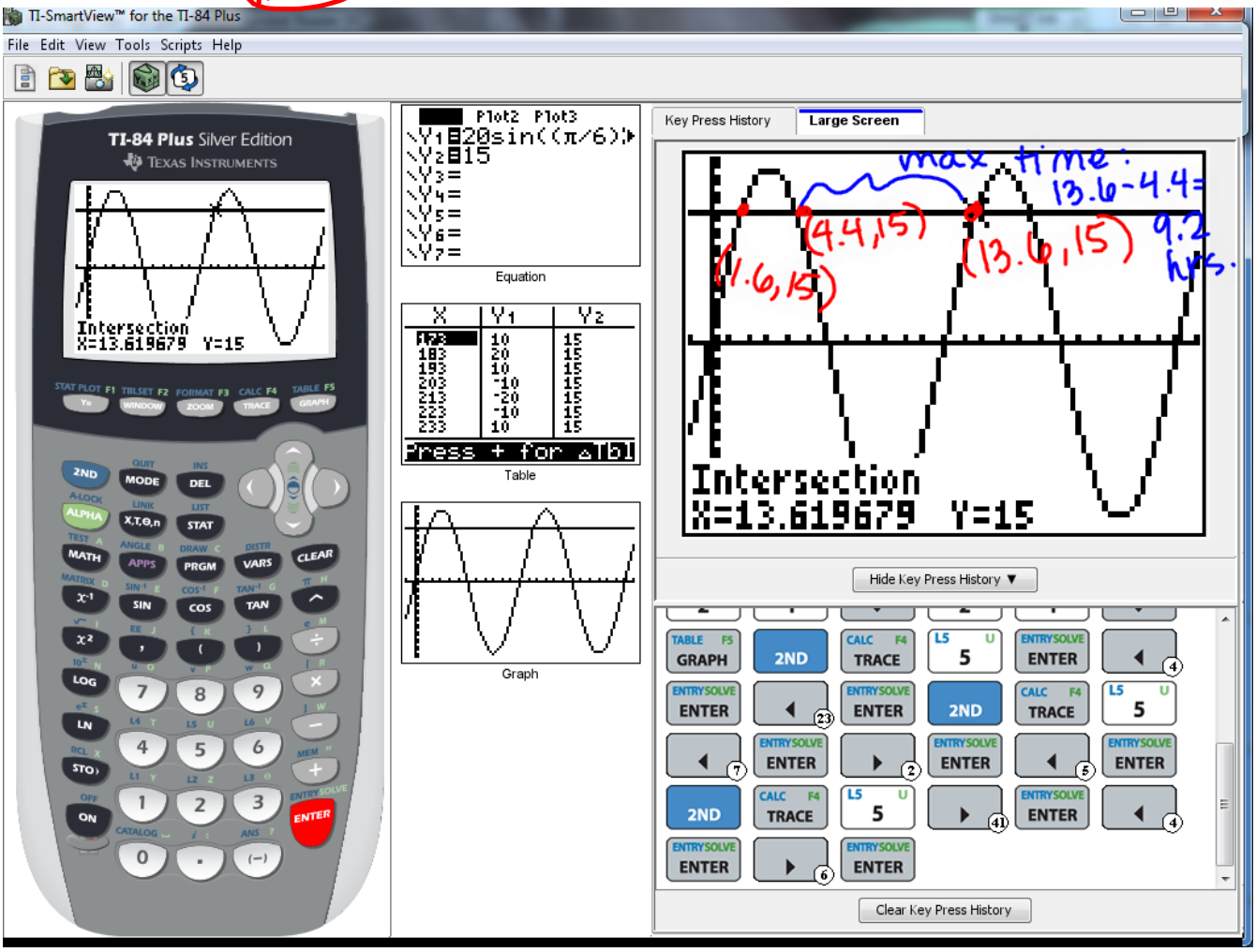
# Questions on 6.11 HW?

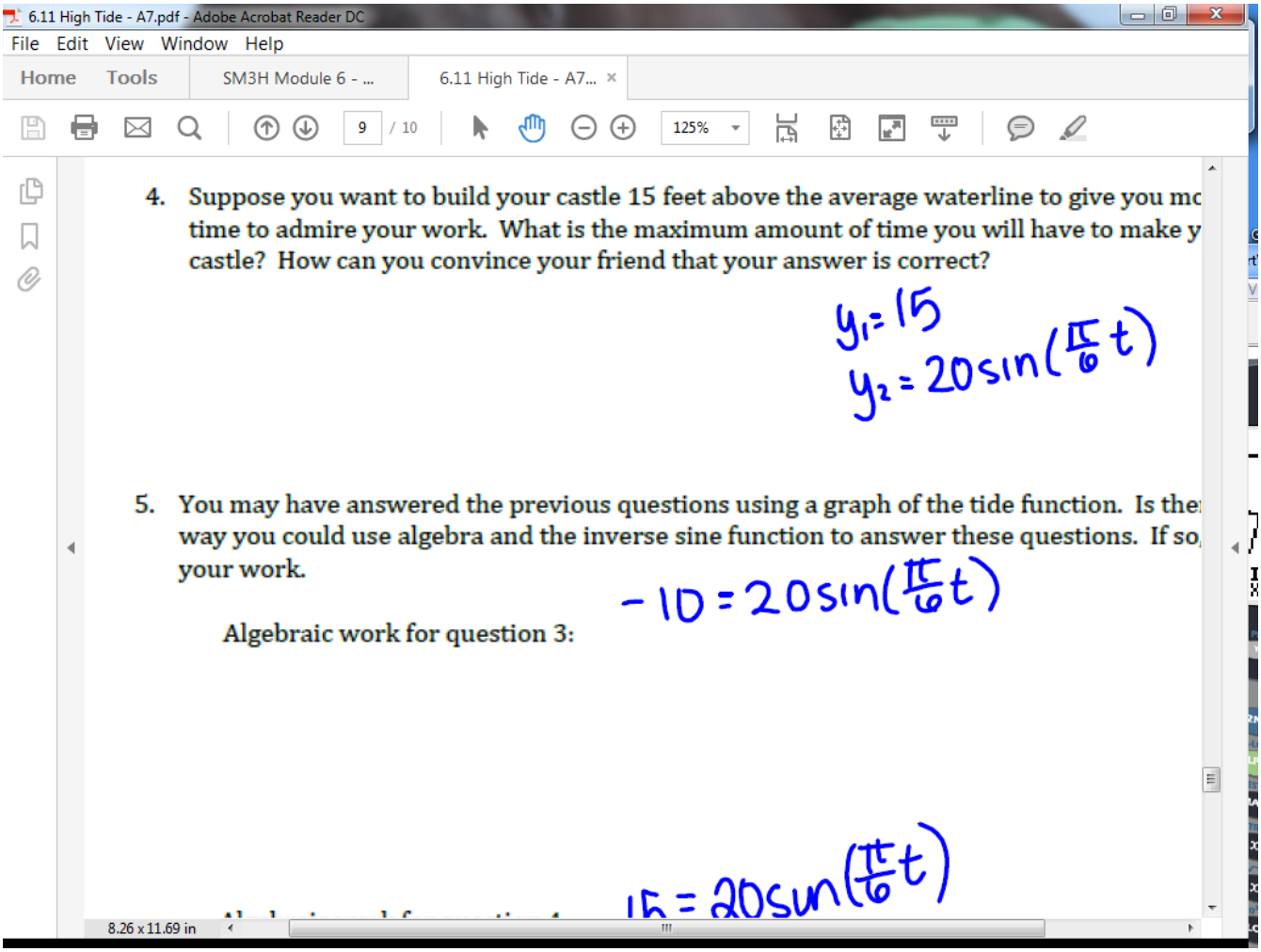
# Unit Circle Quiz Tuesday, practice with template below...




Mar 28-9:51 AM

#4


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
3 10 15
13 20 15
23 10 15
33 -10 15
43 -20 15
53 -10 15
63 10 15
Press + for ΔTbl
Table
Graph
Key Press History
Large Screen
max time:
13.6-4.4=
9.2 hrs.
(4.4,15)
(13.6,15)
(1.6,15)
Intersection
X=13.619679 Y=15
Hide Key Press History
Clear Key Press History


6.11 High Tide - A7.pdf - Adobe Acrobat Reader DC
File Edit View Window Help
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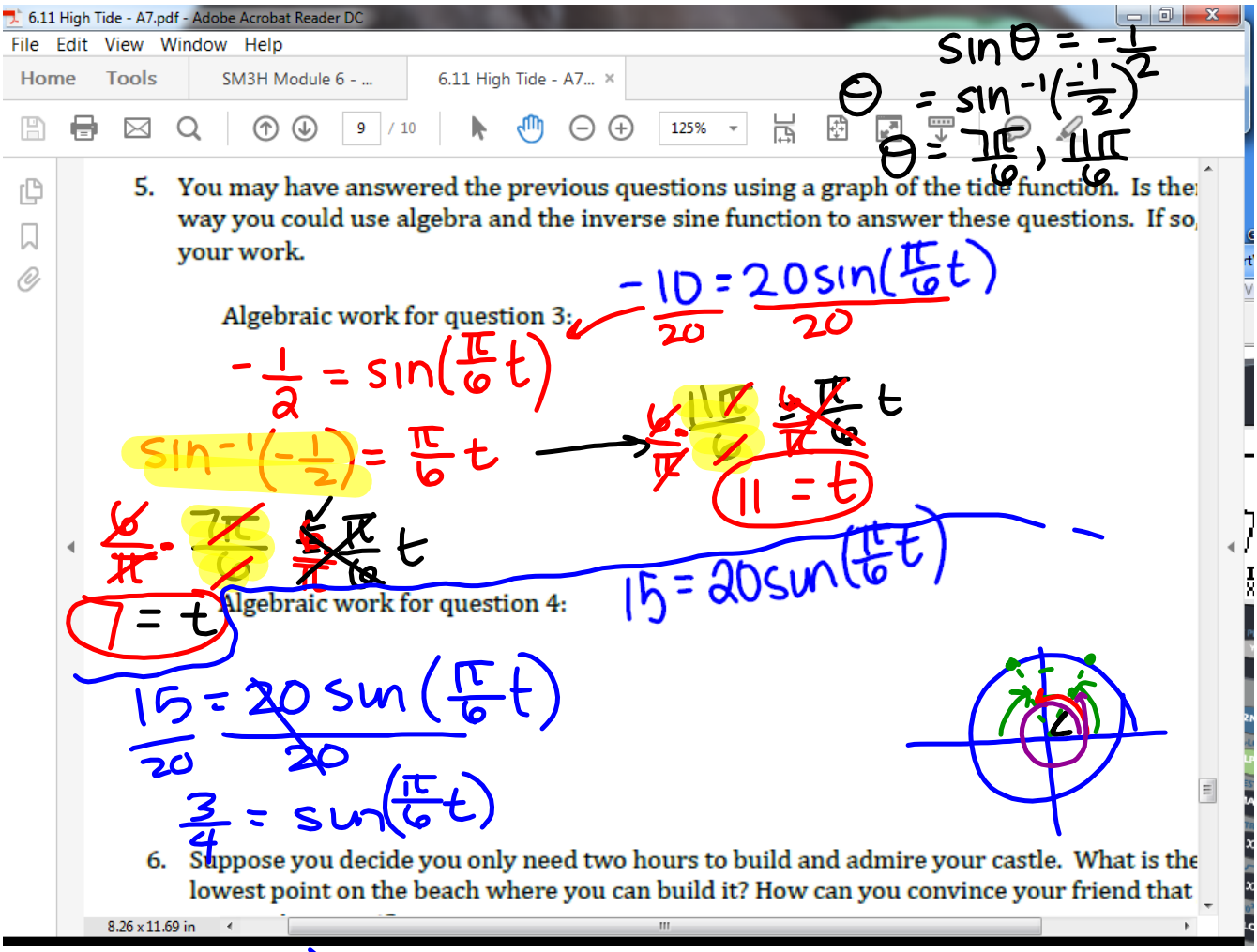
SM3H Module 6 - ...
6.11 High Tide - A7...
9 / 10
125%
4. Suppose you want to build your castle 15 feet above the average waterline to give you mo
time to admire your work. What is the maximum amount of time you will have to make y
castle? How can you convince your friend that your answer is correct?
$y_1 = 15$
$y_2 = 20\sin(\frac{\pi}{6}t)$
5. You may have answered the previous questions using a graph of the tide function. Is the
way you could use algebra and the inverse sine function to answer these questions. If so,
your work.
$-10 = 20\sin(\frac{\pi}{6}t)$
Algebraic work for question 3:
$15 = 20\sin(\frac{\pi}{6}t)$
8.26 x 11.69 in

Mar 15-1:34 PM




$\sin\theta = -\frac{1}{2}$

$\theta = \sin^{-1}\left(-\frac{1}{2}\right)$

$\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$

$\frac{-10}{20} = \frac{20\sin\left(\frac{\pi}{6}t\right)}{20}$

$-\frac{1}{2} = \sin\left(\frac{\pi}{6}t\right)$

$\sin^{-1}\left(-\frac{1}{2}\right) = \frac{\pi}{6}t$

$\frac{6}{\pi}\cdot\frac{11\pi}{6} = \frac{\pi}{6}t$

$11 = t$

$\frac{6}{\pi}\cdot\frac{7\pi}{6} = \frac{\pi}{6}t$

$7 = t$

$15 = 20\sin\left(\frac{\pi}{6}t\right)$

$\frac{15}{20} = \frac{20\sin\left(\frac{\pi}{6}t\right)}{20}$

$\frac{3}{4} = \sin\left(\frac{\pi}{6}t\right)$



$\sin^{-1}\left(\frac{3}{4}\right) = \frac{\pi}{6}t$

$\frac{6}{\pi}\cdot 0.848 = \frac{\pi}{6}t$

$1.61 = t$

$\pi - 0.848$

$\frac{6}{\pi}\cdot 2.29 = \frac{\pi}{6}t$

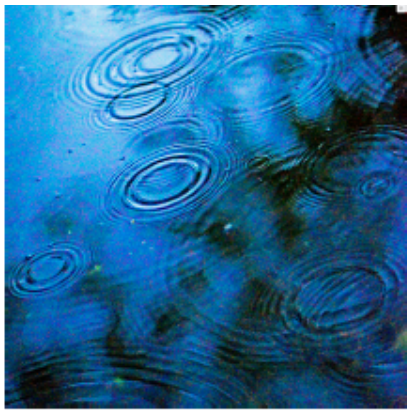
$4.37 = t$

not longest time

$1.61 + 2\pi =$

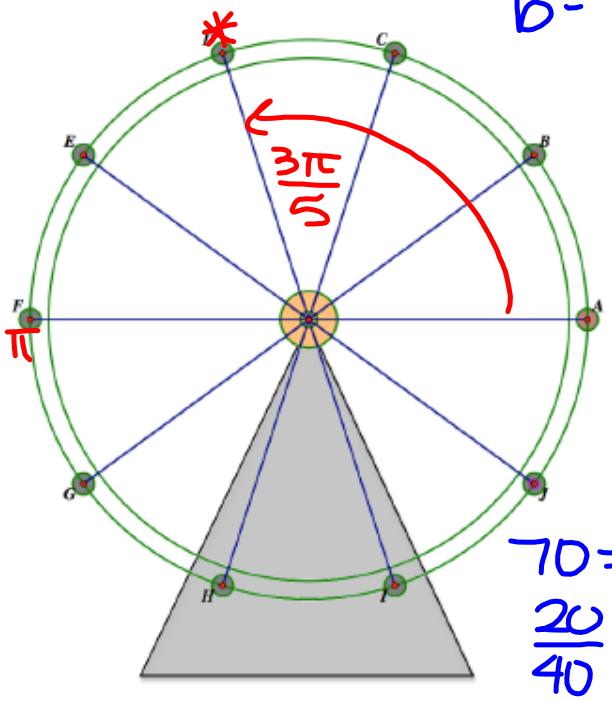
# 6.12 Getting on the Right Wavelength

*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.

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




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).

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

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

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

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

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

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

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

$1.5 = \frac{9}{6} = t$ sec

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

$7.5 = \frac{45}{6} = t$ sec

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.

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).

$h(t) = 50 + 40\sin\left(\frac{\pi}{5}t + \frac{3\pi}{5}\right)$

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.

Mar 14-2:06 PM

# Homework

# Finish 6.12 "Ready, Set, Go"