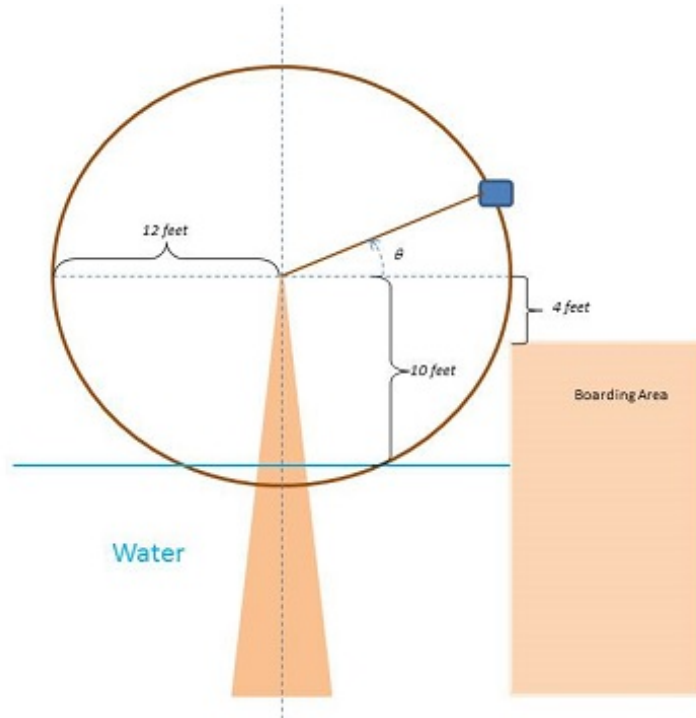


PRACTICE QUESTIONS FOR EXAM IV

An amusement park has a water ride set up in the form of a dunking wheel as shown in the diagram below. Tamar gets into a gondola at the boarding station and rotates counterclockwise around the wheel. Three complete rotations makes up one ride on the wheel. At any point on the wheel, let θ be the radian measure of the rotation angle in standard position whose terminal side is the support beam for Tamara's gondola.



1. If it takes two minutes for Tamar's gondola to complete two-thirds of one complete rotation, what is the angular speed of the water wheel?
2. When Tamar has completed four-fifths of *one ride* on the ferris wheel, what is the radian measure of the angle θ ?

3. The diagram above shows that the boarding platform is located four feet below the horizontal axis.
- (a) How far to the right of the vertical axis will Tamar be when she is at her starting position?
- (b) What is the *clockwise-oriented* radian measure of the angle for Tamara's starting position? What is the *counterclockwise-oriented* radian measure for this angle?
4. What is the slope of the beam supporting Tamar's gondola when she is at the starting position?
5. What is the clockwise-oriented radian measure of the angle where Tamar first *rises out of* the water? What is the counterclockwise-oriented measure for this angle?
6. What is the counterclockwise-oriented measure of the angle where Tamar first *enters into* the water? What is the radian measure of the angle where Tamar enters the water *for the third time*?

7. What is the slope of the beam supporting Tamar's gondola when she enters into the water?
8. Let y represent Tamar's vertical distance in feet above the horizontal axis at any point on the wheel. Construct the formula for a function f that gives y in terms of the number t of minutes that have passed since Tamar started her ride.
9. Let h represent Tamar's vertical distance in feet above the water at any point on the wheel. Construct the formula for a function g that gives h in terms of the number t of minutes that have passed since Tamar started her ride. (Hint — At her lowest point on the wheel, $h = -2$ feet.)