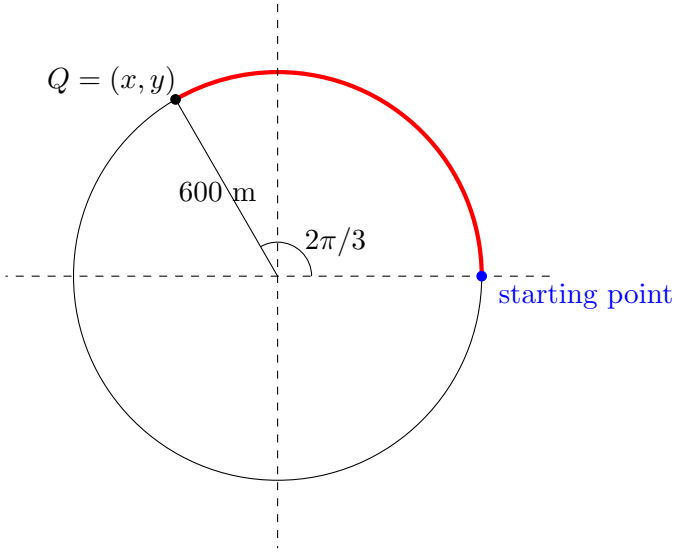
7. [12 points] A race car is traveling around a circular racetrack at **constant** speed. It starts at the 3 o'clock position and moves counter-clockwise around a circular track that has radius 600 meters.

It takes 2/3 of a minute for the car to go from the starting point to the point marked Q.



a. [3 points] What is the speed of the car in meters per minute? Note that the given angle is $2\pi/3$ *radians*.

b. [4 points] Write a formula for $P(t)$, the x-coordinate of the car's position t minutes after the car leaves the start line, where the center of the track is at the origin. Your answer will be a sinusoidal function, and all constants should be left in exact form.

c. [5 points] Using your answer to part **b.**, what are the first two positive values of t (in exact form) at which the x-coordinate of the car is equal to 100?