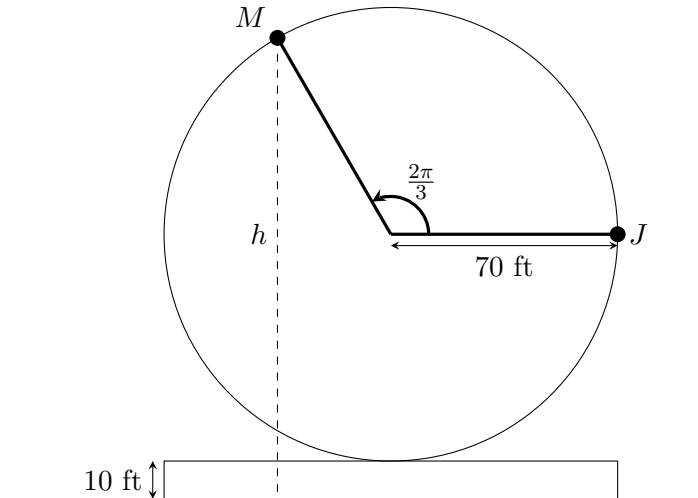


5. [10 points]

Jack takes his little sibling Mo on a Ferris wheel. The Ferris wheel has a radius of 70 feet, and the passengers board on a platform that is 10 feet above the ground. Seats on the Ferris wheel only take one rider at a time, so Jack and Mo end up at different positions on the Ferris wheel. The diagram to the right depicts the moment when Jack is at point J on the Ferris wheel, which is midway between the bottom and the top, and Mo is at point M . The angle between J and M is $\frac{2\pi}{3}$ radians. The Ferris wheel moves counterclockwise.



You do not need to show work for this problem, but may receive partial credit for correct work shown. Give your answers in exact form or correct to at least two decimal places.

- a. [2 points] Assuming the wheel rotates at a constant speed, Jack will reach Mo's current position on the Ferris wheel in exactly 5 minutes. How long does it take the Ferris wheel to make one complete revolution? **Include units.**

Answer: _____ **15 min** _____

- b. [2 points] How far did Mo travel along the circumference of the Ferris wheel between point J and point M ? **Include units.**

Answer: _____ **$140\pi/3 \approx 146.61$ (or **146.60**) ft** _____

- c. [3 points] Find the value of h , Mo's current height above the ground, in feet.

Answer: _____ **$10 + 70 \sin(2\pi/3) = 10 + 35\sqrt{3} \approx 70.62$** feet

- d. [3 points] Find the **horizontal distance** between Jack at point J and Mo and point M , in feet.

Answer: _____ **$70 - 70 \cos(2\pi/3) = 70 + 35 = 105$** feet