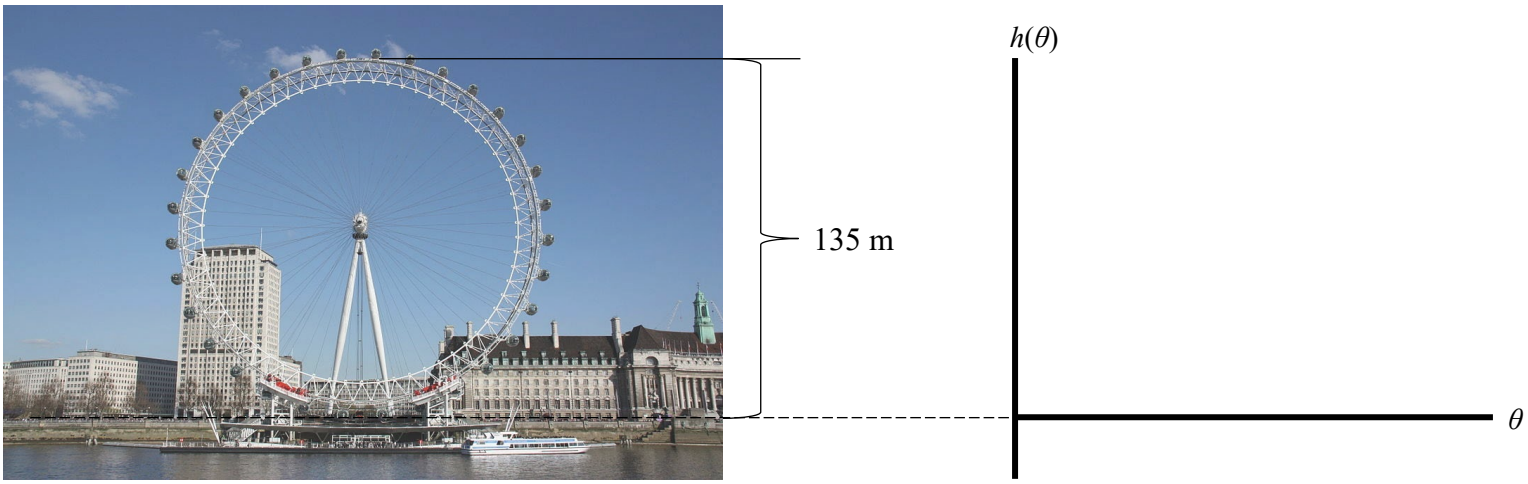
London Eye

A car on the London Eye has vertical height $h(\theta)$, dimension meters. It rotates counterclockwise. One revolution takes a half hour.



1. Construct a graph of $h(\theta)$ for one revolution where at $\theta = 0$ the car is at the **3 o'clock position**.
   Use radians. Label both axes with numbers.

2. Construct a formula for $h(\theta)$. $h(\theta) =$ _____.

3. Complete the blanks. Then write θ (radians) as a function of t (hours), where at $t = 0$ the car is at the **3 o'clock position**.

Number of revolutions	t (hr)	θ (radians)
1	_____	_____
½	_____	_____
¼	_____	_____
_____	0	_____
_____	1	_____
	t	_____

4. Complete: $\theta(t) =$ _____.

5. Complete: $d\theta/dt =$ _____. Report the units: _____. This quantity is called the _____ velocity.

6. Use substitution to construct a formula for $h(t)$. $h(t) =$ _____.
   Again assume at $t = 0$ the car is at the **3 o'clock position**.

7. Complete:
   a. $dh/dt =$ _____.
   b. The vertical height h of the car changes the *fastest* at what clock position(s)? 3 o'clock 12 o'clock 9 o'clock 6 o'clock
   c. The vertical height h of the car changes the *slowest* at what clock position(s)? 3 o'clock 12 o'clock 9 o'clock 6 o'clock