How high am I?

Teacher notes

Why use this resource?

This is a problem in which students have an opportunity to apply some basic trigonometry. It is good to prompt students to think about how they would explain why their solutions work for all angles from $0 - 2\pi$.

Key questions

- What would you label on a diagram?
- What does your formula tell about how your height would change as the wheel goes round?
- What happens if θ is obtuse? What if it's reflex?

Possible extension

- Think about how their formula relates to the range of $\cos\theta$.
- What if they wanted to find the value of θ at which the height is a given value?

There is the potential for students to use the half-angle formulae and curve sketching in order to derive a formula for height, so this resource could be used when these are encountered and two ways of solving compared. Within this resource there are links to resources in which students may deepen their understanding of half-angle formulae.