

Jade – Kiddy Wheel

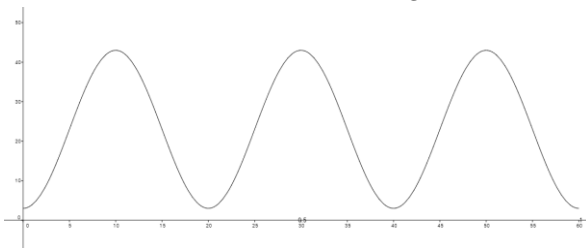
Height 0.5m to 8m
 2 revolutions per minute
 $8 - 0.5 = 7.5$
 $7.5 \div 2 = 3.75$

$$y = A \sin B(t - C) + D \quad A = 3.75 \quad D = 3.75 + 0.5 = 4.25 \quad B = \frac{2\pi}{30} = \frac{\pi}{15}$$

So by a process of elimination

Kiddy Wheel is $h(t) = 3.75 \sin \frac{\pi}{15}(t - 7.5) + 4.25$

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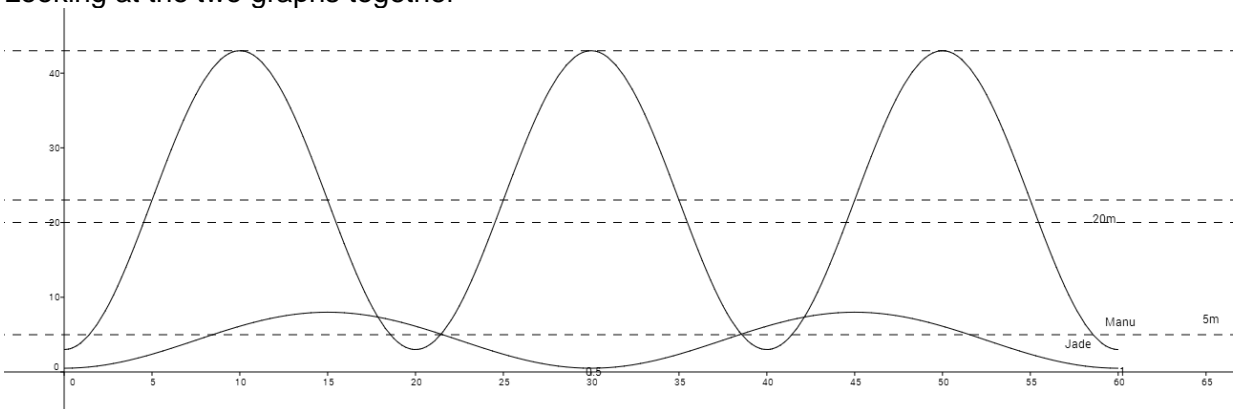
Manu – Flying - High Ferris
 Height 3m to 43m
 3 revolutions per minute
 $43 - 3 = 40$
 $40 \div 2 = 20$

$$A = 20 \quad D = 23 \quad B = \frac{2\pi}{20} = \frac{\pi}{10} \quad C = 5$$

So $h(t) = 20 \sin \frac{\pi}{10}(t - 5) + 23$

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Looking at the two graphs together



Where can Jade see Manu

$$\text{Jade} \geq 5 \quad 3.75 \sin \frac{\pi}{15}(t - 7.5) + 4.25 \geq 5$$

t is between 8.461 & 21.5385 and 38.461 & 51.5385

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Manu – going up, ≥ 5 and ≤ 20

$$5 \leq 20 \sin \frac{\pi}{10}(t - 5) + 23 \leq 20$$

t is between 1.44 & 4.52 and 21.44 & 24.52 and 41.44 & 44.52

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so the intersection of these solutions is the time when Jade can see Manu in the first 60 seconds

t is between 21.44 to 21.54 sec and 41.44 to 44.52 sec

this will happen every 60 seconds for the duration of the ride.

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