

1. A ferris wheel has a diameter of 24 metres and rotates once each 46 seconds. If the bottom of the ferris wheel is raised 2 metres above the ground and the ride starts from the bottom of the ferris wheel:

(a) Write an equation to relate the height, y metres above the ground, of a person t seconds after the ride starts.

(b) Find the time it takes for the height to reach 20 metres for the first time (to the nearest tenth of a second).

2. A high tide depth of 7.6 m occurs at 5:25 AM and low tide depth of 1.2 m occurs at 11:45 AM.

(a) Write an equation to relate the depth, y metres, of the water t hours after midnight.

(b) Find the depth of the water at 3:40 pm (to the nearest tenth of a metre).

(c) What time will the first high tide occur on the following day?

3. The pedals of a bicycle have a maximum height of 32 cm and a minimum height of 10 cm above the ground. A person pedals at a constant rate of 20 cycles/minute. Find an equation to describe how the height, y metres above the ground, varies with the time, t seconds after starting if the pedal starts 21 cm above the ground and rising.