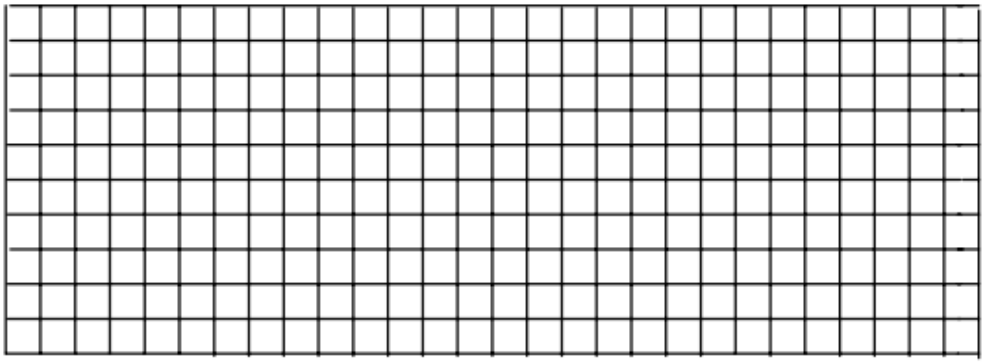
A pendulum on a grandfather clock is swinging back and forth as it keeps time. A device is measuring the distance the pendulum is above the floor as it swings back and forth. At the beginning of the measurements the pendulum is at its highest point, 36cm high exactly one second later it was at its lowest point of 12cm. One second later it was back to its highest position.

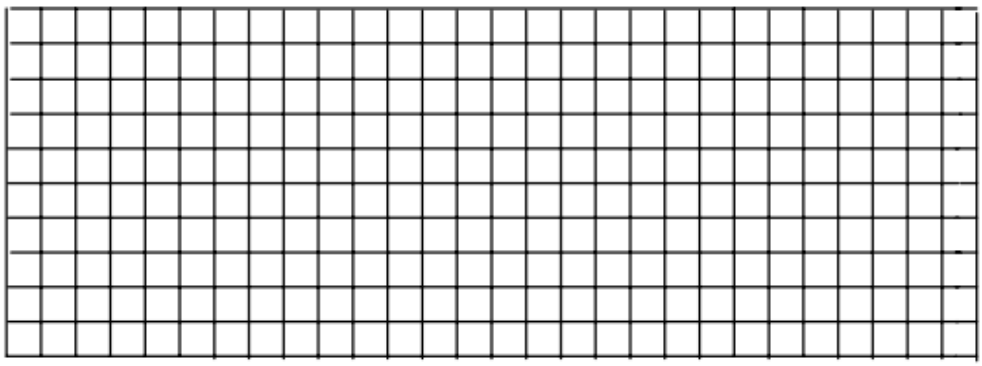
a) Use the information above to sketch a diagram of this sinusoidal movement.



b) Write the sinusoidal equation (sine and cosine) that describes this situation.

In Canada's wonderland there is a roller coaster that is a continuous series of identical hills that are 18m high from the ground. The platform to get on the ride is on top of the first hill. It takes 3 seconds for the coaster to reach the bottom of the hill 2m off the ground

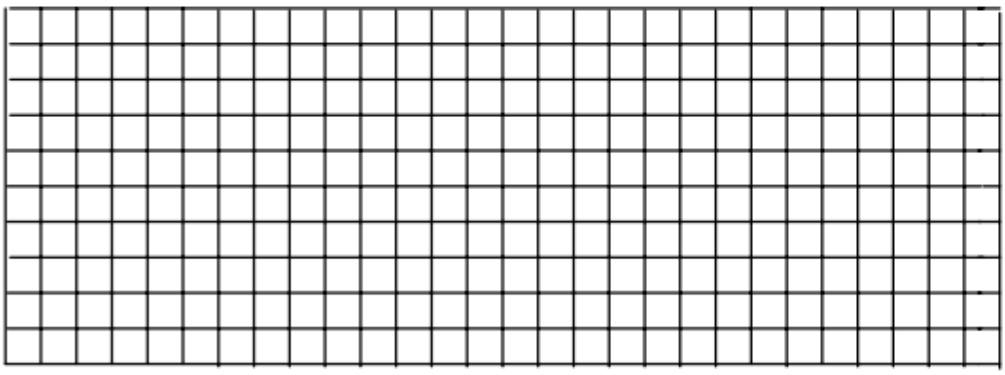
a) Sketch a graph below which expresses the path of the roller coaster.



a) What is the sinusoidal equation (sine and cosine) that best reflects this roller coaster's motion?

Sam is riding his bike home from school one day and picks up a nail in his tire. The nail hits the ground every 2 seconds and reaches a maximum height of 48 cm (assume the tire does not deflate).

a) Use the information above to sketch a diagram of this sinusoidal movement.



b) Write the sinusoidal equation (sine and cosine) that describes the situation in part a.