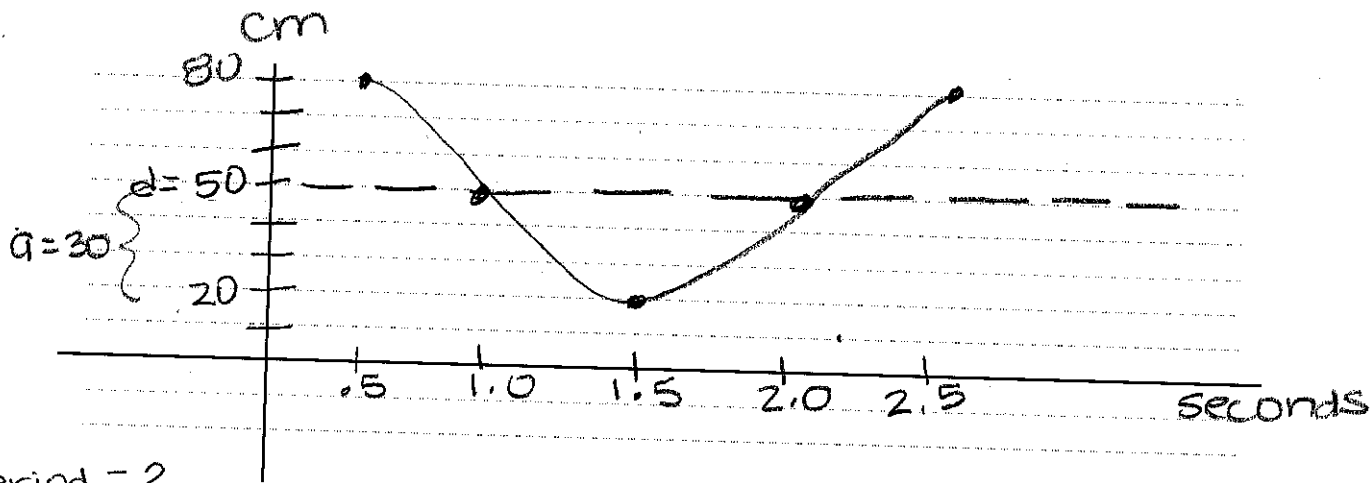


A weight attached to the end of a long spring is bouncing up and down. As it bounces, its distance from the floor varies sinusoidally with time. You start a stopwatch. When the stopwatch reads 0.5 seconds, the weight first reaches a high point 80 cm above the floor. The low point, 20 cm above the floor, occurs at 1.5 seconds.

(a) Graph and find an equation for the distance from the floor as a function of time.



Period = 2

$$\frac{2\pi}{b} = 2$$

$$2b = 2\pi$$

$$b = \pi$$

equation: $y = 30 \cos \pi (t - 0.5) + 50$

(b) What is the distance from the floor when the stopwatch reads 18.2 seconds?

2nd calc \rightarrow value \rightarrow 18.2 = 67.63cm

(c) What was the distance from the floor when you started the stopwatch?

2nd calc \rightarrow value \rightarrow 0 = 50cm

(d) What is the first positive value of time when the weight is 64 cm above the floor?

1. New equation $\rightarrow y_2 = 64$

2. 2nd calc \rightarrow intersect \rightarrow enter \rightarrow enter \rightarrow

find intersection (enter) \rightarrow .15sec