Blake Q's #4

May 24, 2020

This question sheet is going to solve a real life problem. I want to make a video game where a coin is floating up and down. Watch the 4 min YouTube video below to get a feel for how this works.

WATCH THIS BEFORE YOU BEGIN (4 min): `https://www.youtube.com/watch?v=pEXdTLsEAjk`

Question 1

I am going to animate the coin with the formula below, where at most I want it to travel 20cm up and down. I am going to make the coin start 50cm above the ground. What will the height(y) be when the angle is 60 degrees?

$$y = 20sin(\theta) + 50 \tag{1}$$

Question 2

Using the same formula as in question 1, what will the angle be when the height is 40cm?
Hint: Let y = 40 and solve for θ

$$y = 20sin(\theta) + 50 \tag{2}$$

Question 3

The last animation was cool but I want to make it look like its bouncing. I am now going to use the formula below. What will the angle be when the height is 57.5cm?
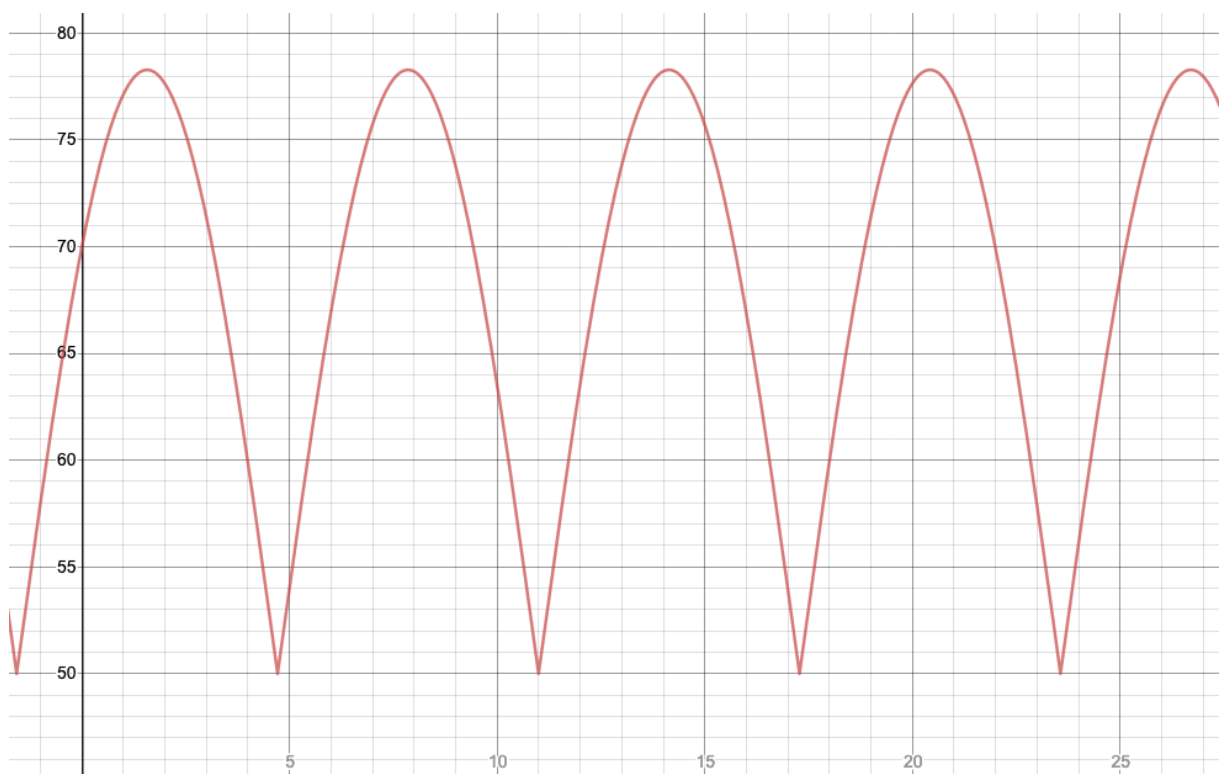*Hint: Let y = 57.5 and solve for θ*

$$y = 20\sqrt{\sin{(\theta)} + 1} + 50 \tag{3}$$

Figure 1: Bouncing coin animation