

VC_04_26_22

Unit 5 Problem Set 2

Problem 6

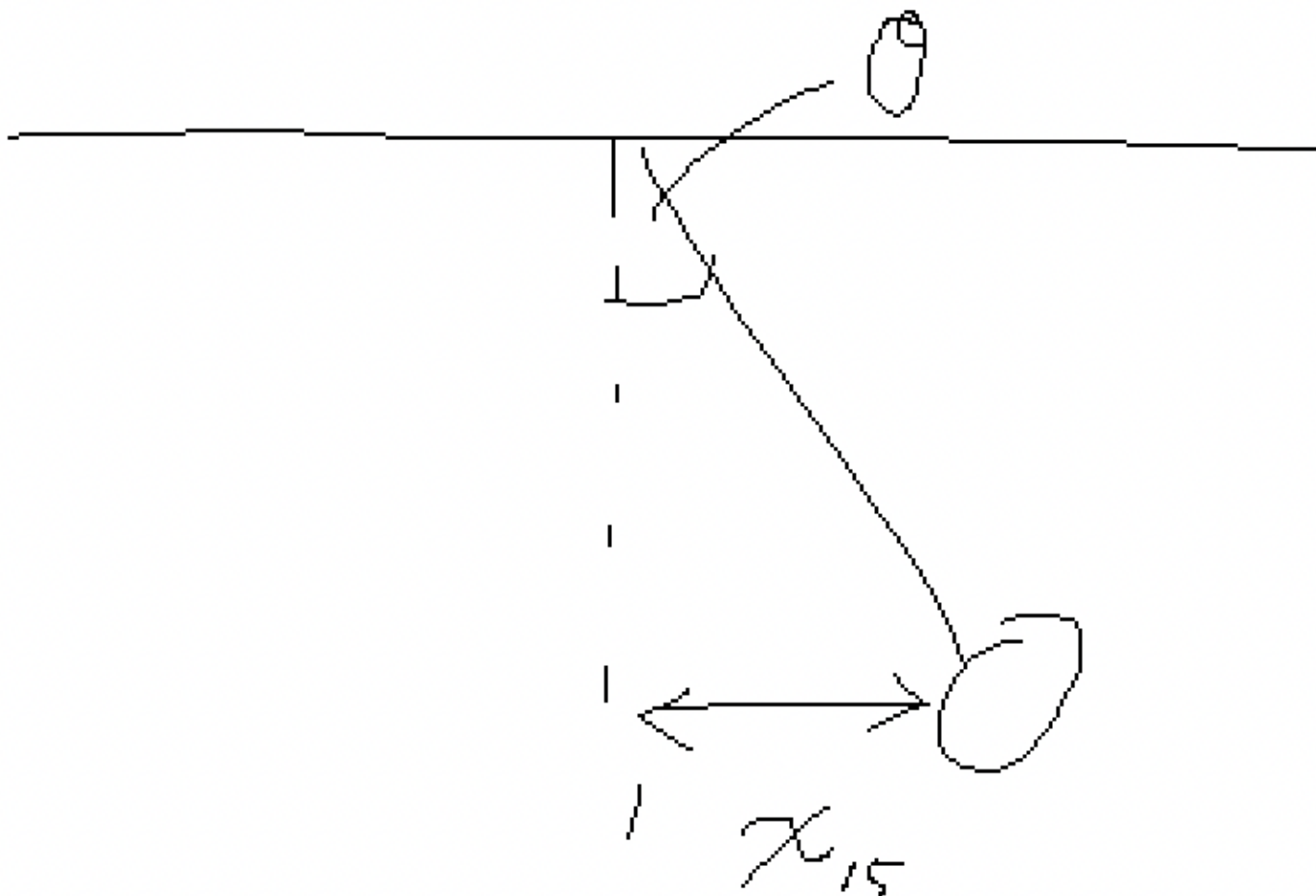
A 2.5 m long string hangs vertically and holds a mass of 3 kg on the end. you pull the mass to the side, so the string is 5 degrees from equilibrium, then release it. calculate the angle of the string after 15s.

Recall the formula for the position x after t time.

$$x = A \cos(2\pi ft)$$

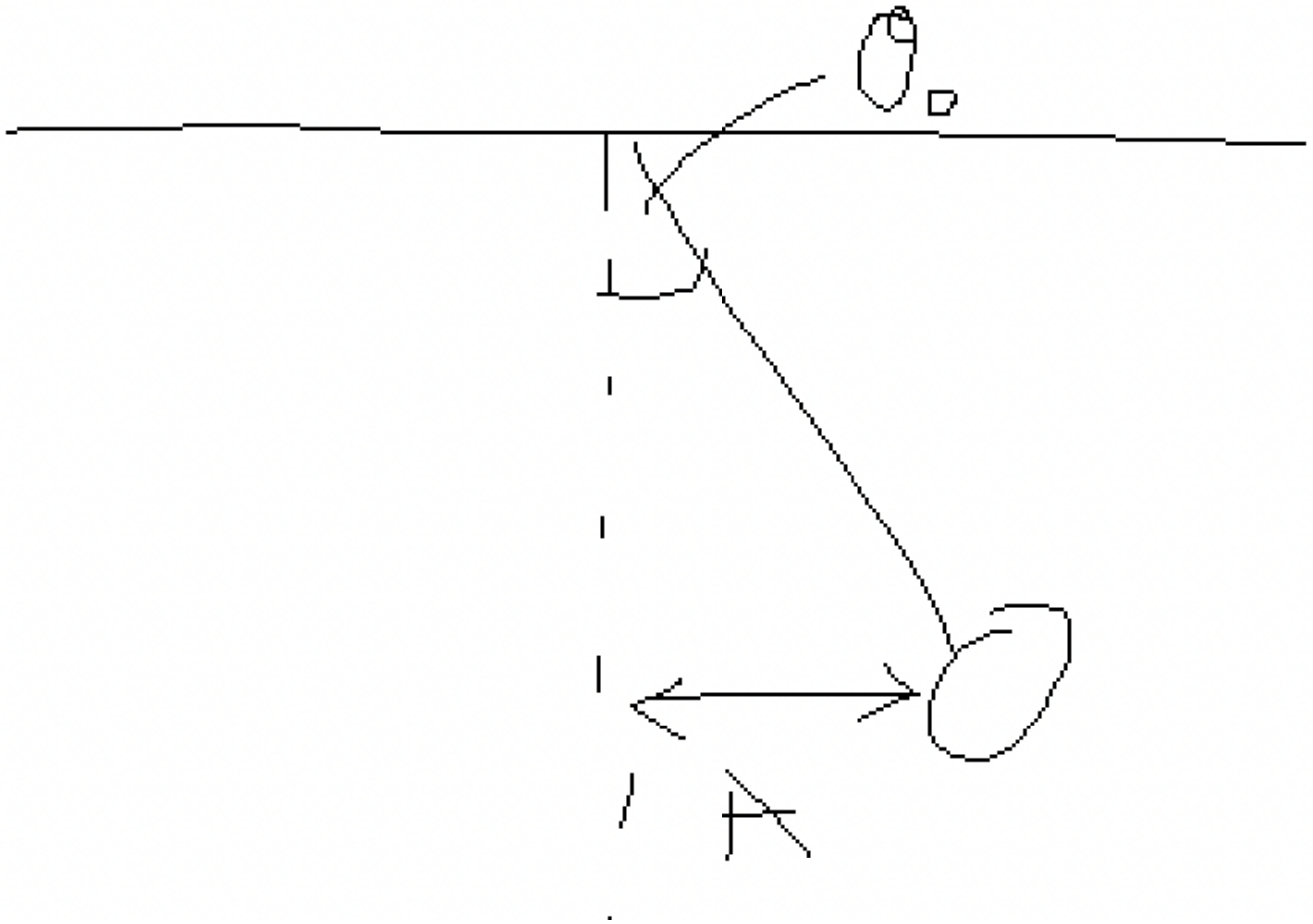
where A is the amplitude and f is frequency.

But why is this equation useful?



Notice that if we find the position x after 15 seconds. Since we also know that length of the pendulum, we can use trig relationships to obtain θ . Thats a good plan!

For the x equation we need to find A and f .



$$\sin(5) = \frac{A}{2.5}$$

$$A = \sin(5)2.5$$

$$f = \frac{1}{2\pi} \sqrt{\frac{g}{L}}$$