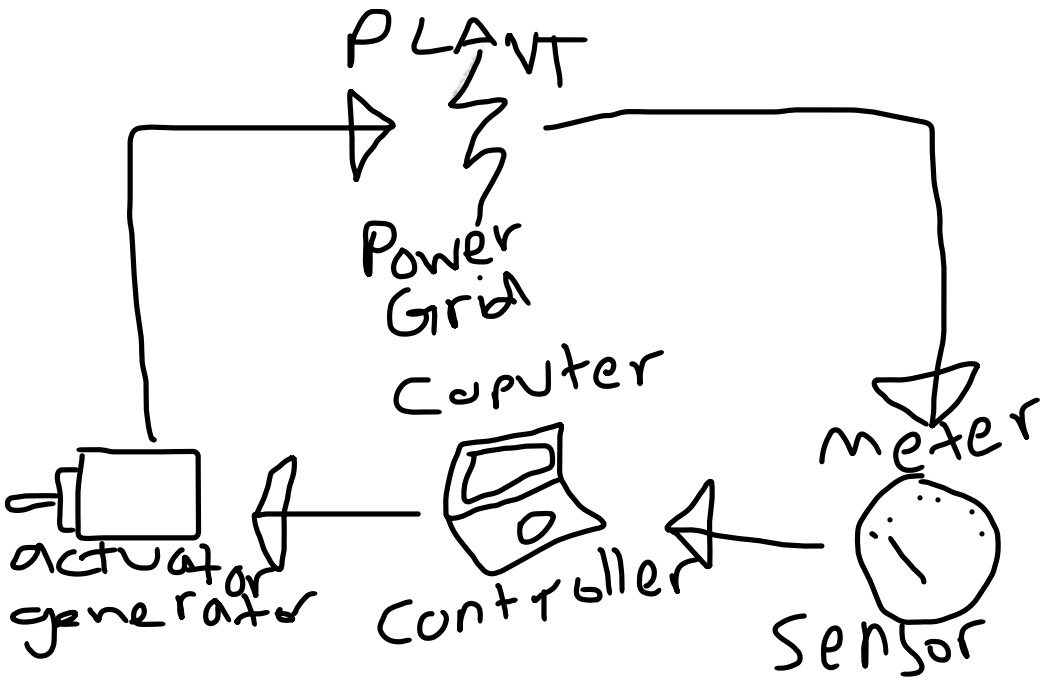
Engin 112 HW 5

Power grid block diagram



2.

a. computation, calculators and phones have more power to computer than every person combined.

The ability to harness power for mechanical work. In present day compared to the past, machines have gotten a lot smaller and can hold more power. The speaker talks about a drone motor being 500 times stronger than the steam engine lb for lb

Sensing, the drone that the speaker used had a 1kg inertial nav system that is in the middle. Now our phones also have the same ins that's much smaller and has the same capabilities

b. mathematical models are built oof physical principles. The speaker used to balance a pendulum while flying a drone as an example. Applying physical properties (adding the stick) there should be a set of mathematical relations applied to control stability and performance. Therefore, making the drone successfully balance the pendulum even while being direction on where to fly.

3.

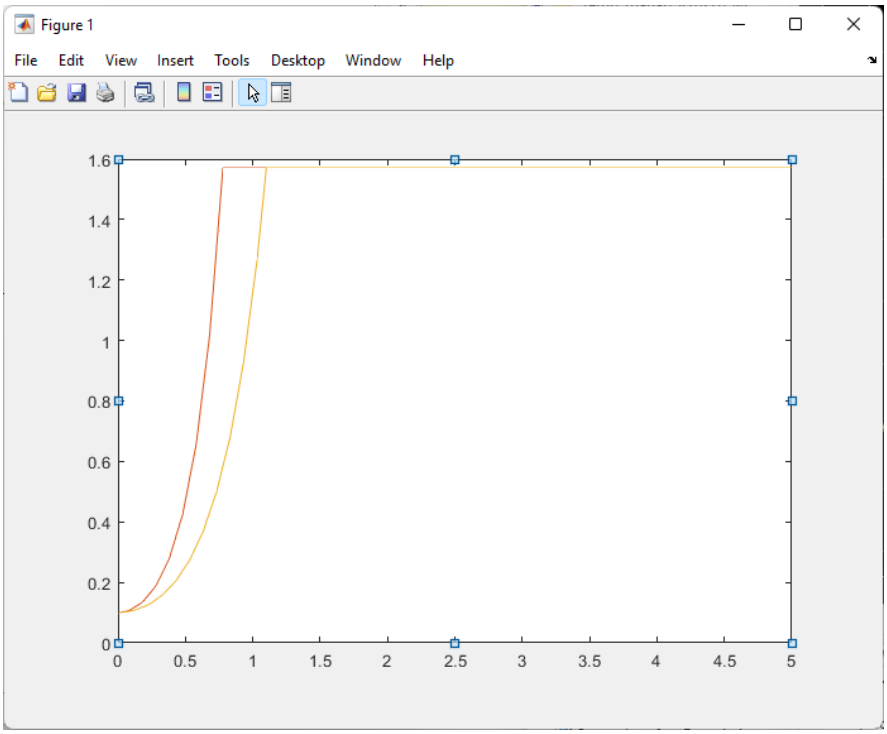
a. 1=1/2(e^0+e^0)

1=1/2(1+1)

1=1/2(2)

1=1

b. the shorter length stick falls faster than the longer length stick because the equation multiplies by a smaller fraction because the length is in the denominator of the exponents square root. As length increases the amount the stick moves in a set amount of time is less than if the stick was shorter.

c. 

4. the plant is stable because the coefficient of y is not positive

b. k>3

t’’+t’ -3y =v

t’’+t’ -3y = -kpy

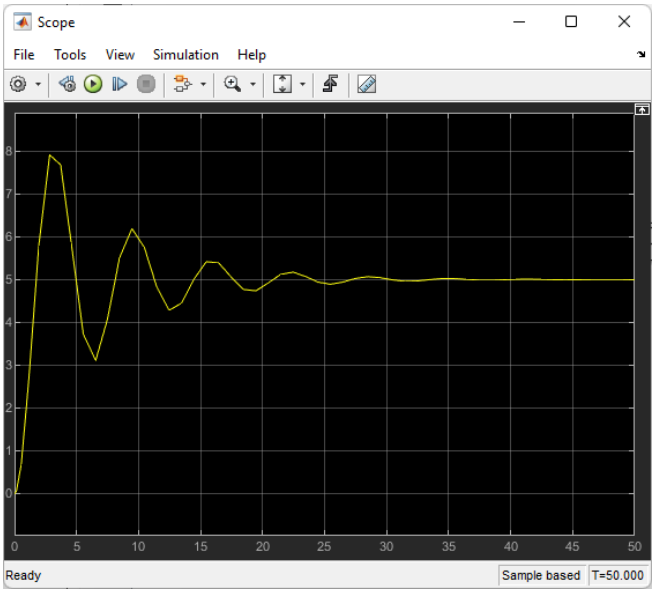
t’’+t’+y(kp-3) =0

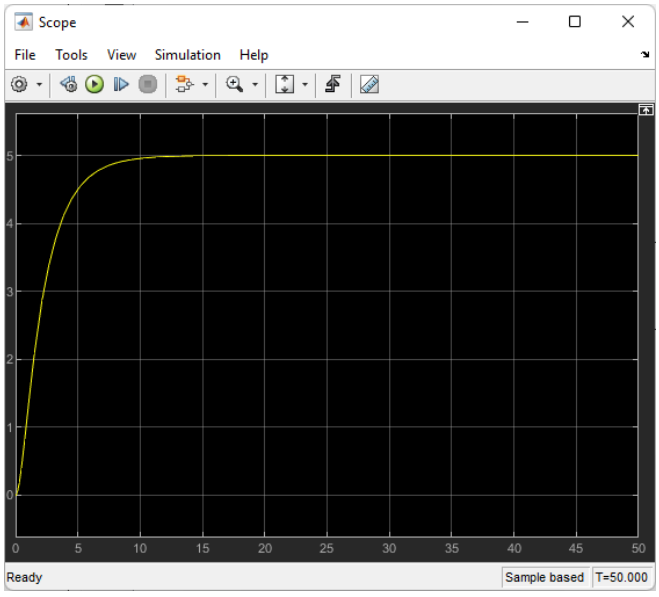
kp-3>0

kp>3

any value of k over 3 will make the system stable.

5. a yes, the plant is stable because the 1st and 2nd derivatives are both positive.

b. 

c. 

yes it was successful in reducing the oscillations

6. no

No

No

no