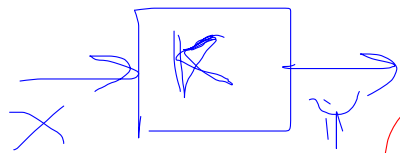
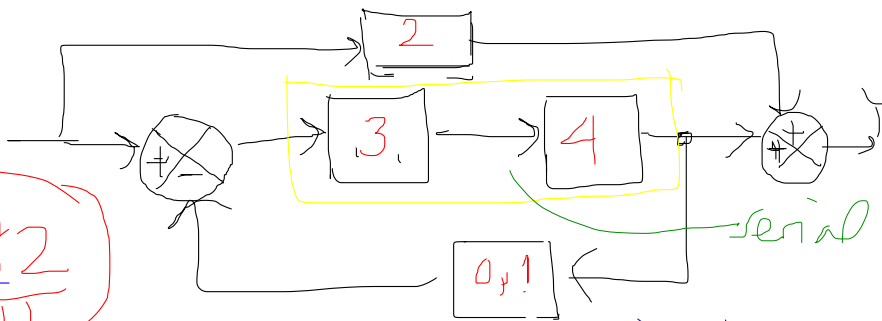


* Contoh matematis



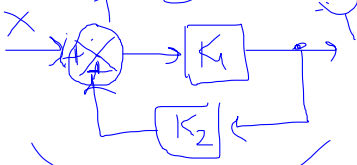
$$K = ? ? ?$$

$$K = \frac{82}{11}$$



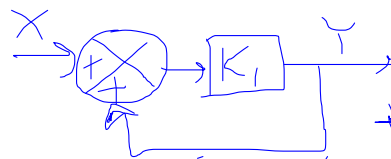
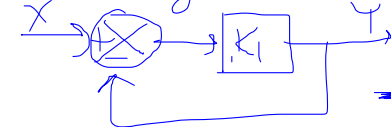
Untuk latihan

* Positive feedback



$$K = ? ? ?$$

* Unity feedback



Umpan-balik satuan

$$Y = KX$$

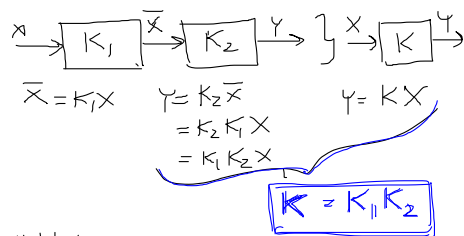
$$Y = \frac{K_1}{1 + K_1 K_2} X$$

$$K = \frac{K_1}{1 + K_1 K_2}$$

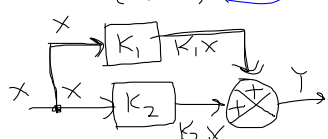
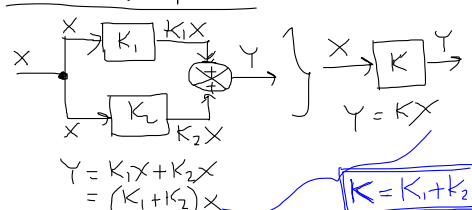
ALJABAR BLOK KOTAK

Block Diagram ALGEBRA

* Hubungan serial (CASCADE)



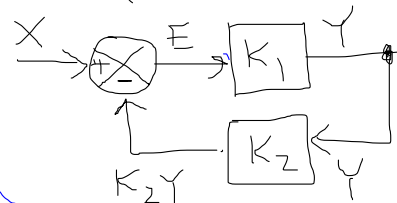
* Hubungan paralel



Hubungan umpan-maju (feed forward)

* Hubungan Umpan-balik

(feed back)

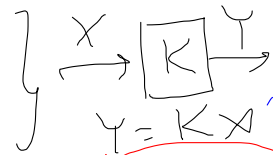


(negative feedback)

$$E = X - K_2 Y$$

$$Y = K_1 E$$

$$Y = K_1 [X - K_2 Y]$$



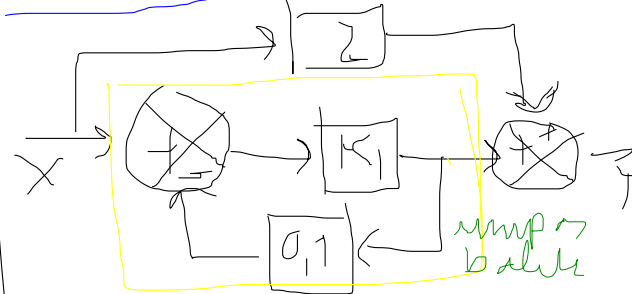
$$Y = KX$$

$$Y = K_1 X - K_1 K_2 Y$$

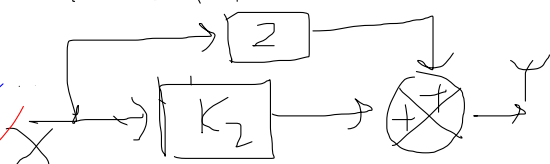
$$[1 + K_1 K_2] Y = K_1 X$$

$$Y = \frac{K_1}{1 + K_1 K_2} X$$

* Dengan aljabar banyak Kotak



$$K_1 = 3, 4 = 12$$



$$K_2 = \frac{K_1}{1 + 0,1 K_1} = \frac{12}{2,2}$$

$$Y = K_2 + 2 = \frac{22}{11} + \frac{60}{11} = \frac{82}{11}$$