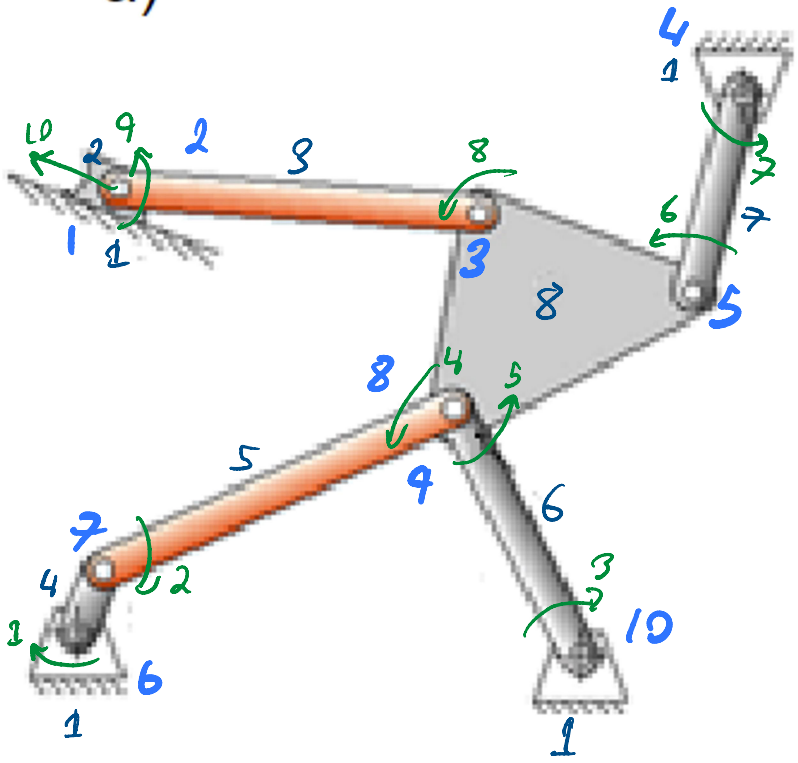
Assignment 5

March 30, 2023 3:45 PM

1)

a)



g = # joints = 10

n = # links = 8

f = d.o.f. = 10

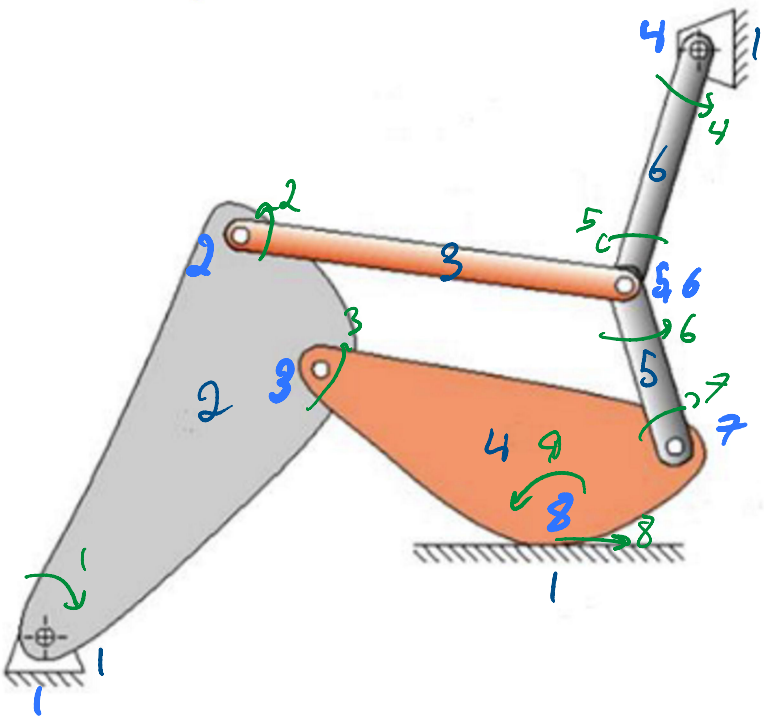
$m = 3(n-g-1) + \sum f_i$

$= 3(8-10-1)+10$

$= 1$

$\because m \geq 1 \quad \therefore$ linkage

b)



$g = 8$

$n = 6$

$f = 9$

$m = 3(6-8-1)+9$

$= 0$

$\because m = 0 \quad \therefore$ structure

c) (treat vehicle as ground)

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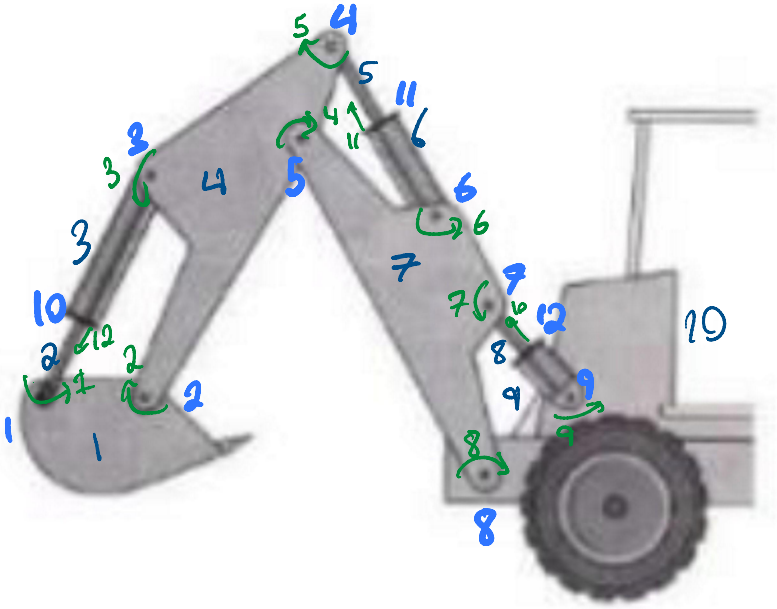
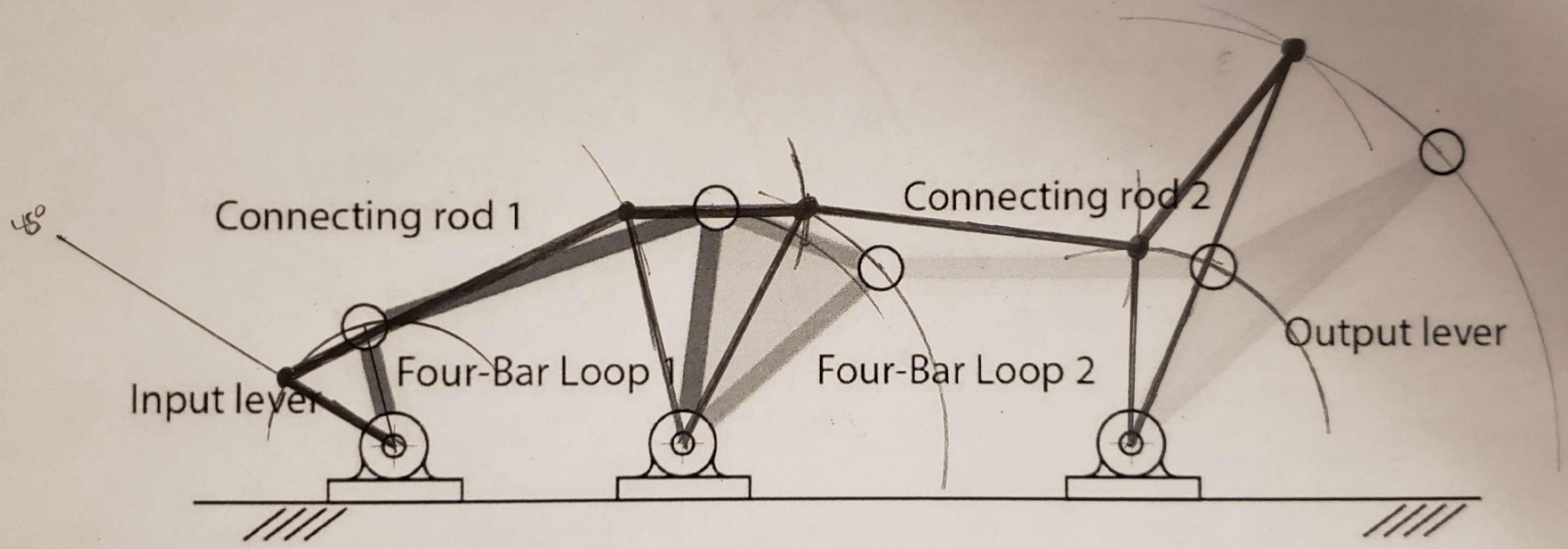


12
10
12

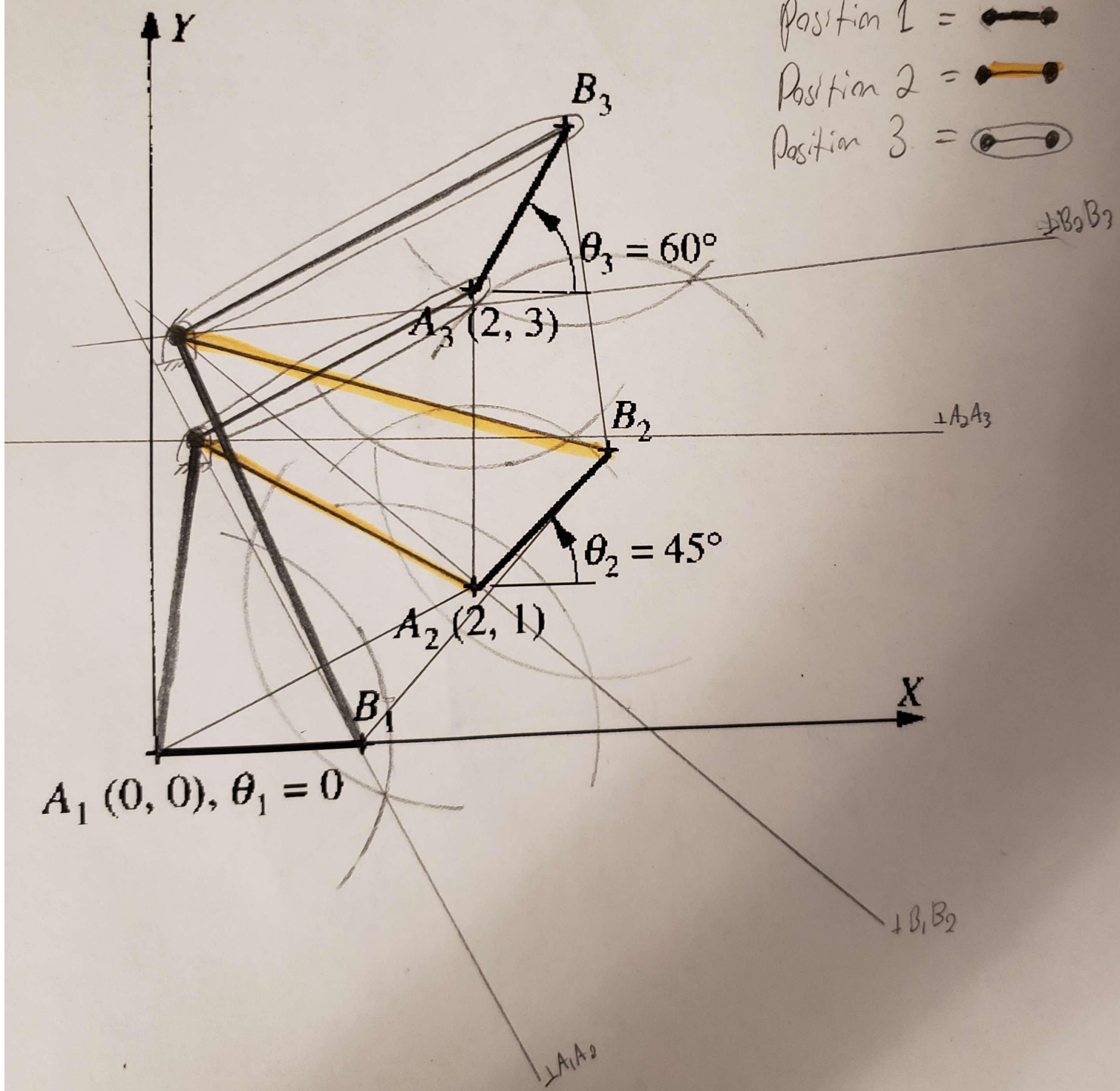
$m = 3(10 - 12 - 1) + 12$

$= 3$

$m \geq 1$ ∴ linkage



Six-Bar Linkage


Position 1 =
Position 2 =
Position 3 =
Y
X
B_3
$\theta_3 = 60°$
A_3 (2, 3)
B_2
$\theta_2 = 45°$
A_2 (2, 1)
B_1
A_1 (0, 0), $\theta_1 = 0$
$\perp B_2B_3$
$\perp A_2A_3$
$\perp B_1B_2$
$\perp A_1A_2$