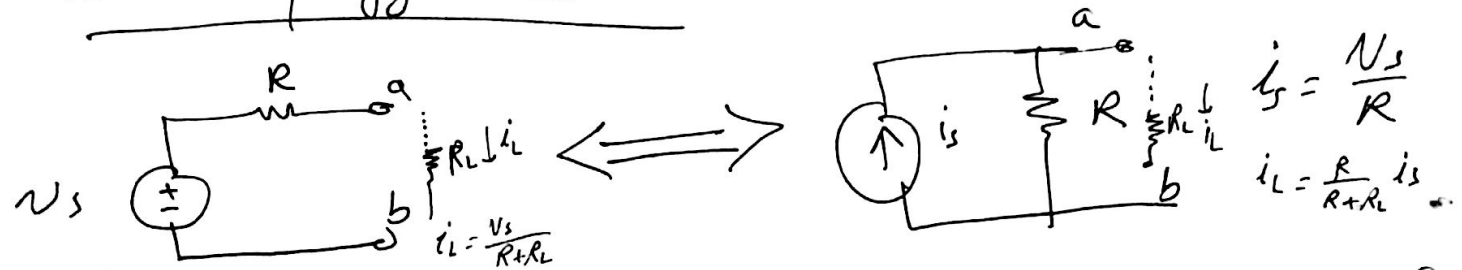


Lec (6)
Circuits

Section 4.9

Source transformation

Used to simplify the circuit

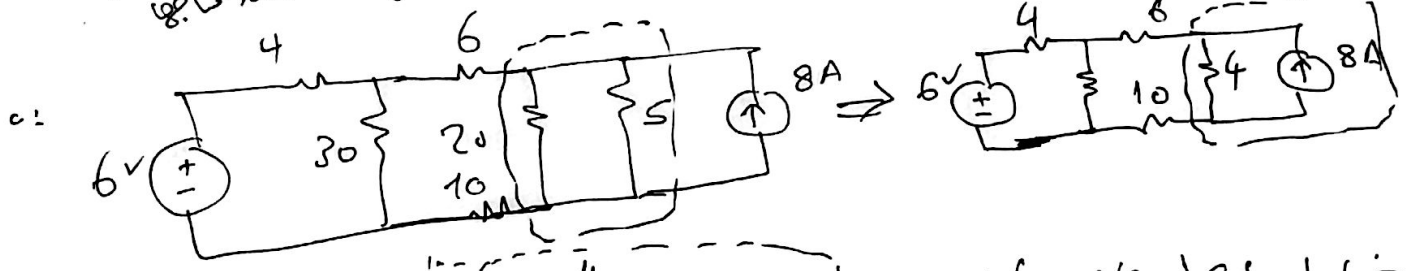
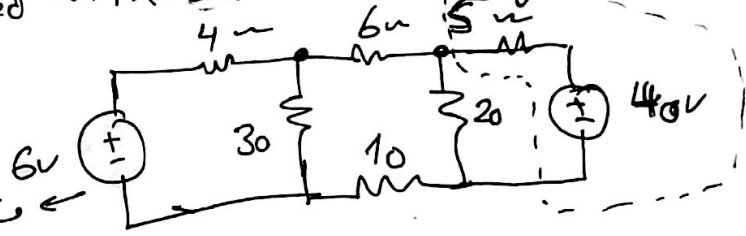


$V_s = I_s R$

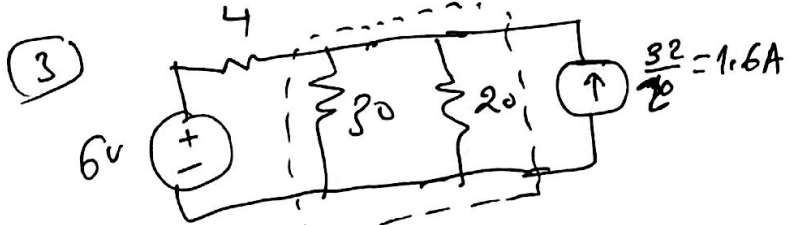
ex) Find the Power associated with 6V source (using source transformation)

1) Reduce (4, 5) to

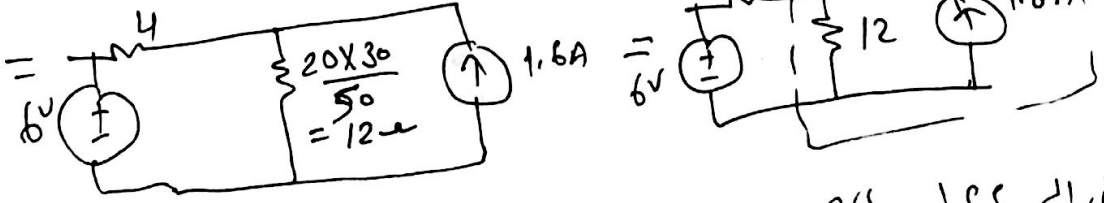
$(i = \frac{4}{5} = 0.8A, R = 5\Omega)$



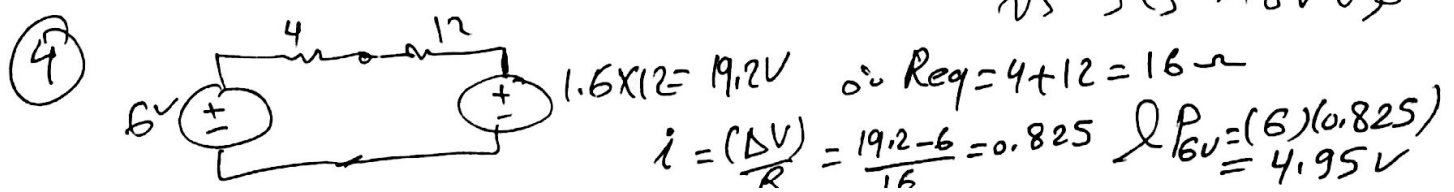
سویچ V_s و C_S حذف



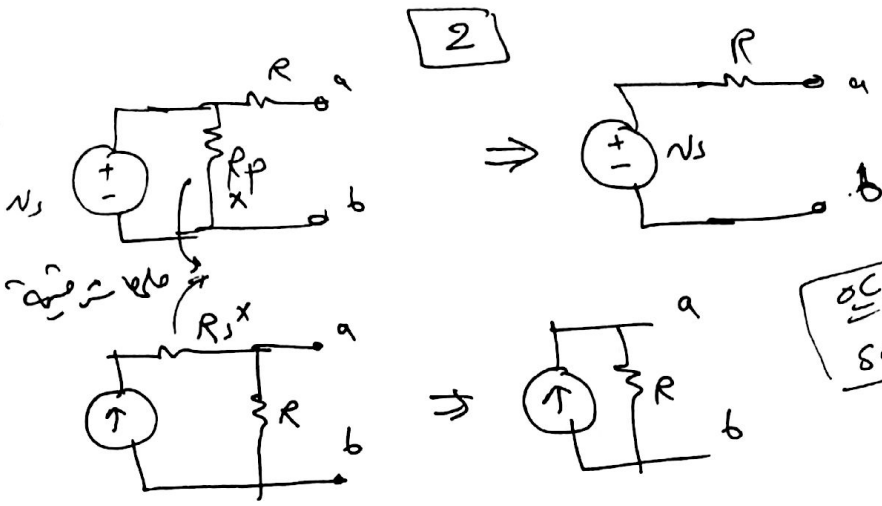
سویچ V_s و C_S حذف
سویچ V_s و C_S حذف
 $4 + 6 + 10 = 20\Omega$
در سری V_s و C_S



سویچ V_s و C_S حذف

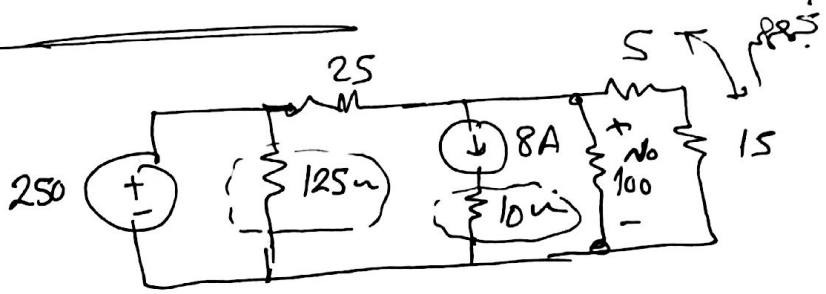


مقاومة

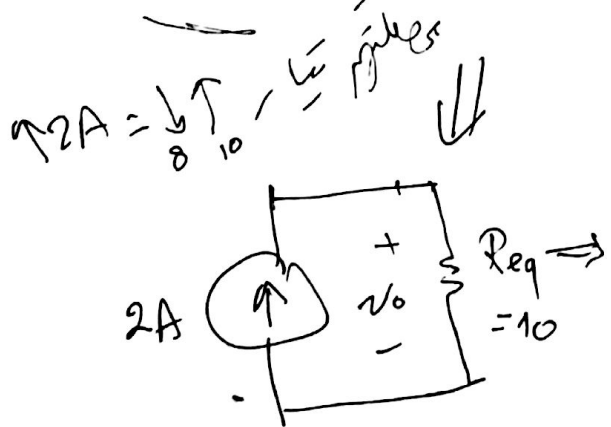
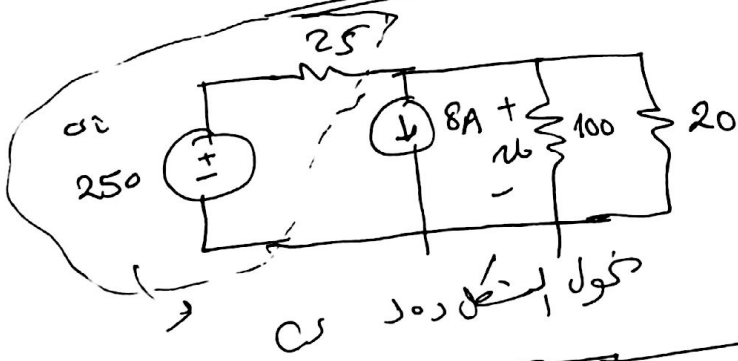


EX 2

Find \$V_o\$ using source transform



CS series, \$V_s\$ Parallel



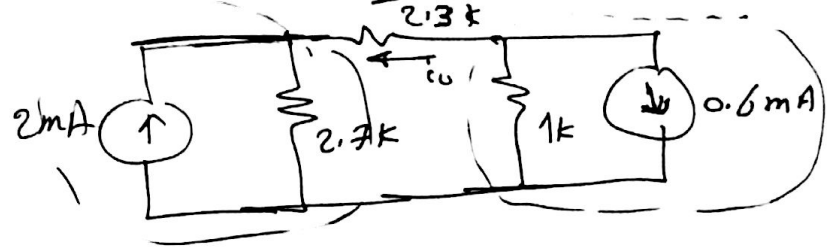
$V_o = 2 \times \frac{20}{10} = 2 \times 2 = 20V$

Parallel
 100 Ω
 20 Ω
 25 Ω

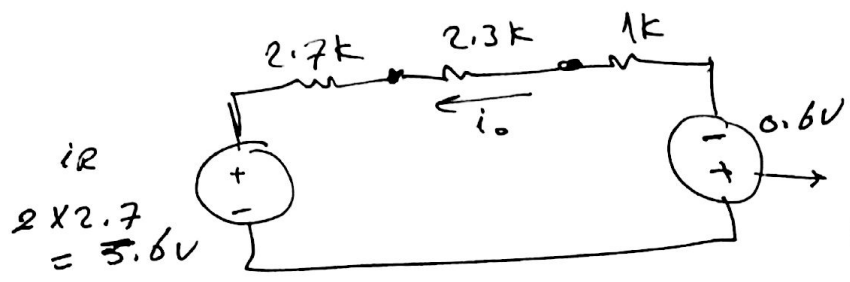
$\frac{1}{R_{eq}} = \frac{1}{25} + \frac{1}{100} + \frac{1}{20}$
 $\frac{1}{R_{eq}} = \frac{4+1+5}{100} = \frac{10}{100} = \frac{1}{10}$
 $R_{eq} = 10$

EXTRA Examples

ex 4.59 find i_o using source transform.



Quiz
use Node voltage to verify answer



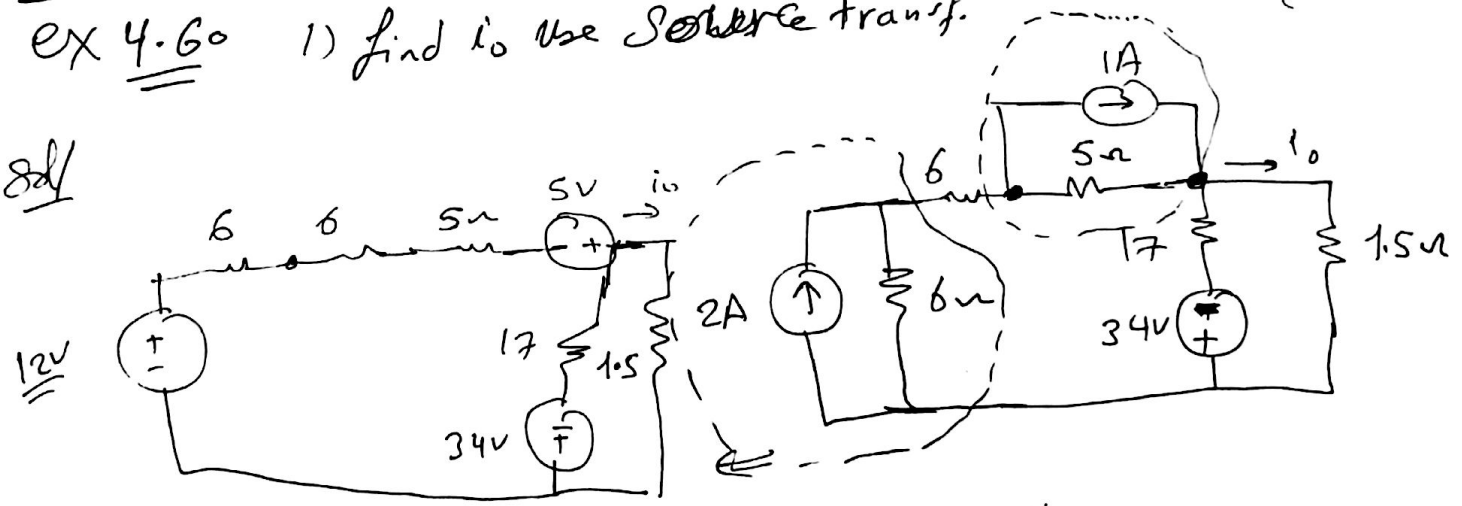
$$i_o = \frac{[-0.6] - (5.6)}{(2.7 + 2.3 + 1)k} = -1mA$$

$v_1 = 2.7$
 $v_2 = 0.4$

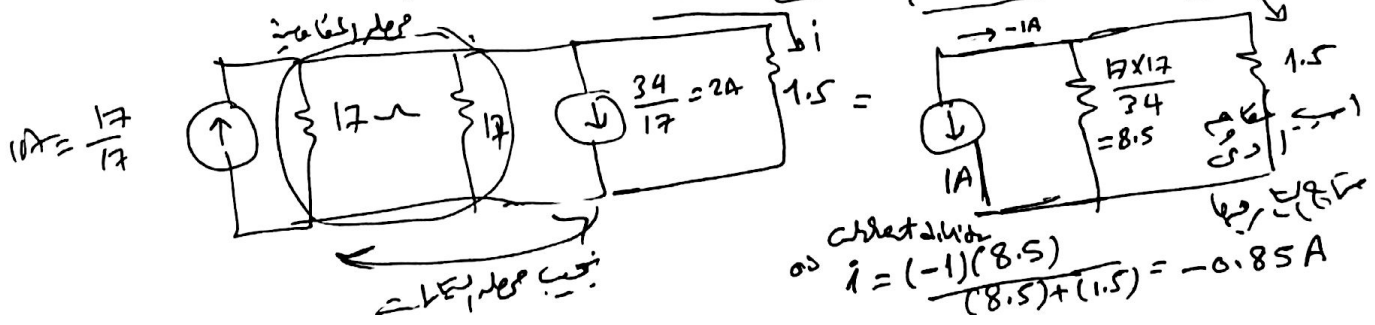
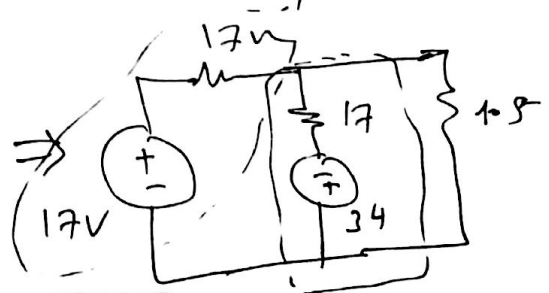
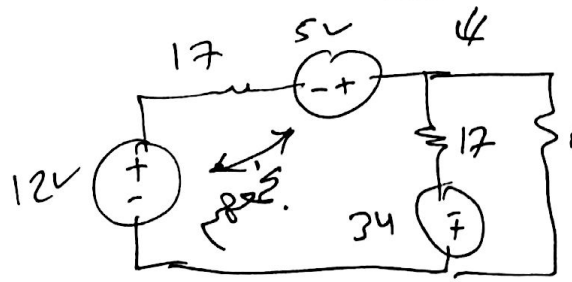
رنگ
الاستیک و پلاستیک
کلی

ex 4.60 1) find i_o use source transform.

82/

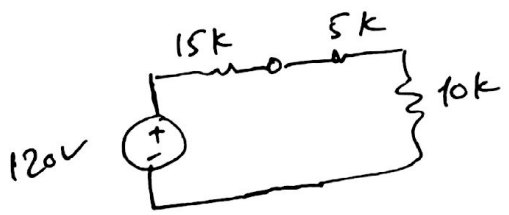
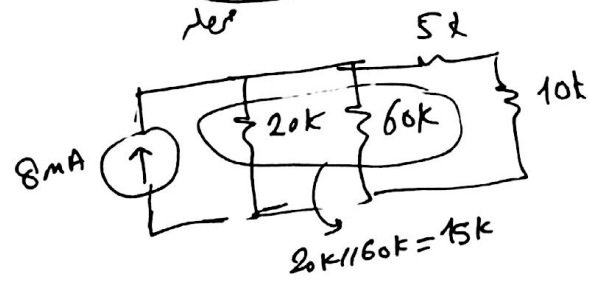
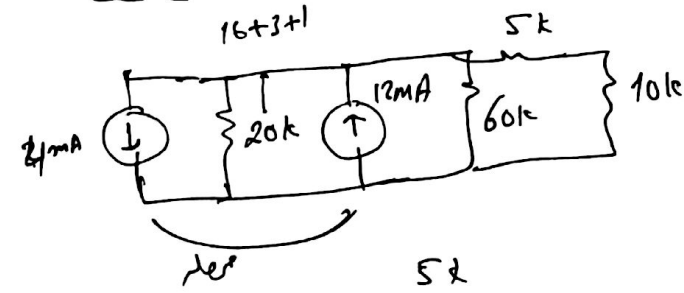
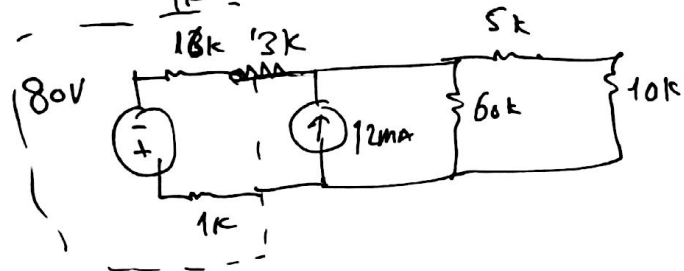
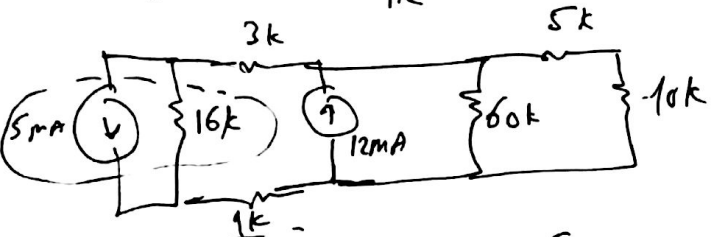
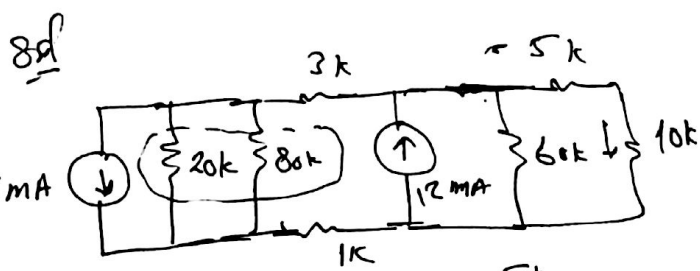
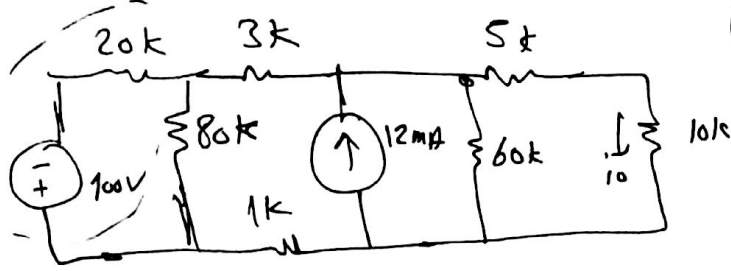


مش (Mesh)



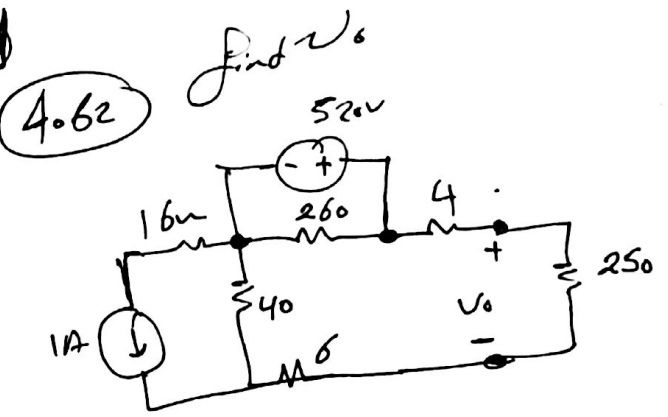
حساب
 $i = \frac{(-1)(8.5)}{(8.5) + (1.5)} = -0.85A$

4.61 Find i_o

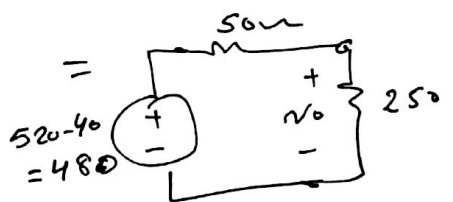
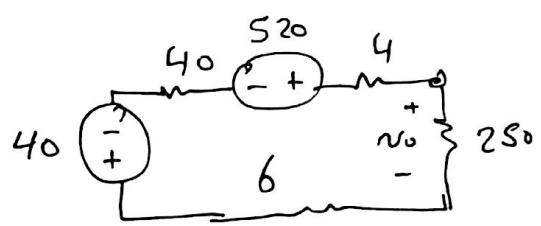
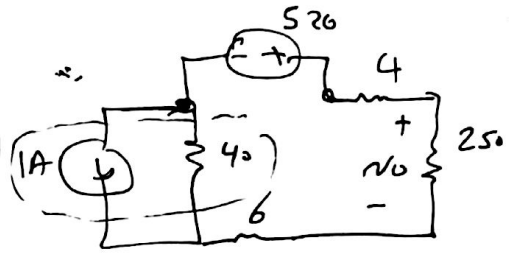


$$i = \frac{120}{10 + 20k} = 4mA$$

4.62



Sol Remove 260 & 16
Parallel to v_s (o.c)
series with (e.s) (S.E)



$$v_o = i \times 25 = \frac{480}{25 + 4} \times 25 = 400V$$