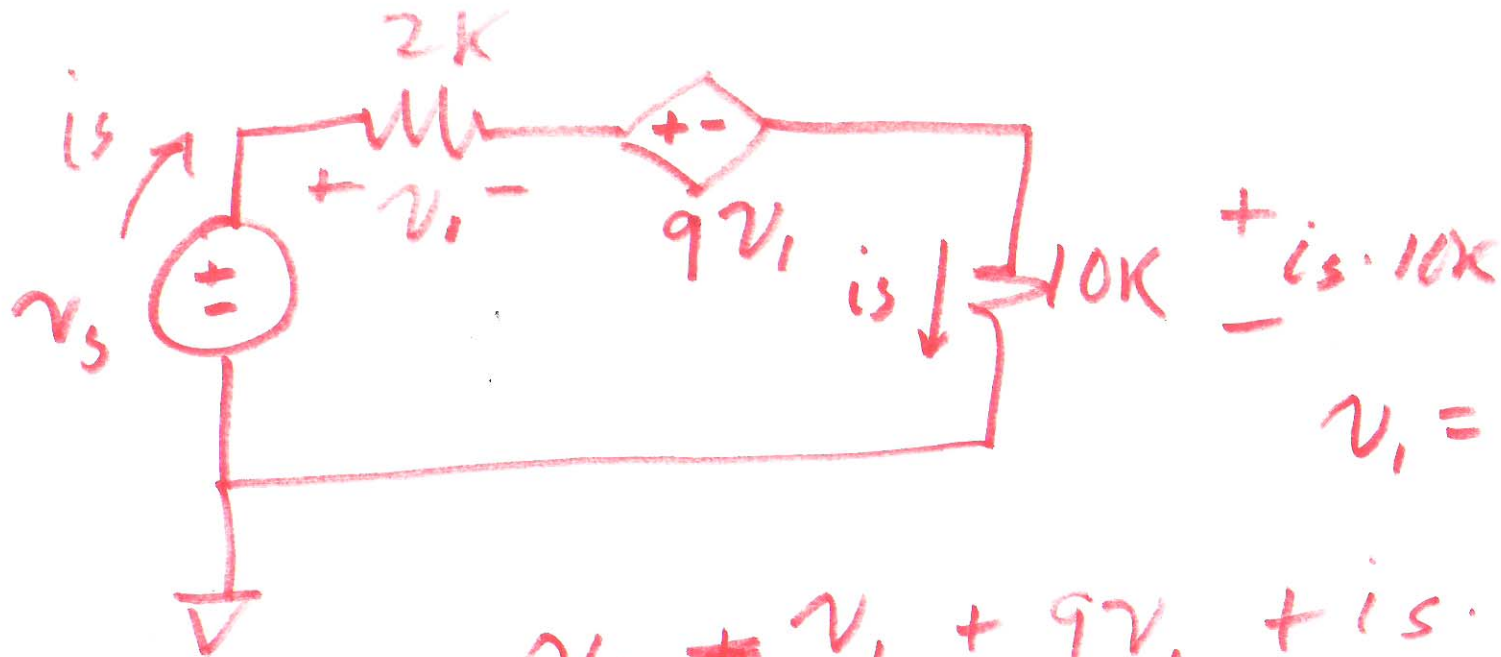


EE 220

CIRCUITS I

6/16/14

Lecture 6



$$v_1 = 2k \cdot i_s$$

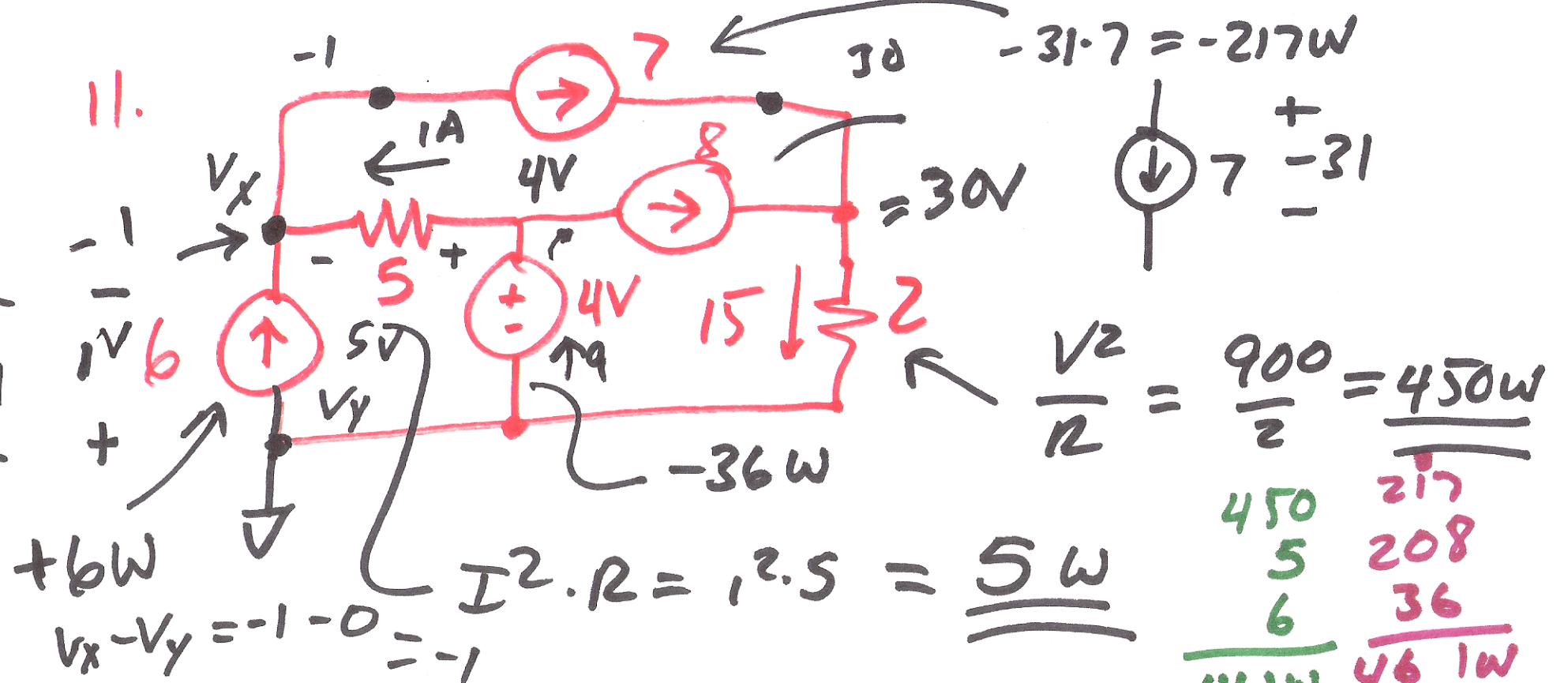
$$v_s = v_1 + 9v_1 + i_s \cdot 10k$$

$$v_s = 2k i_s + 18k i_s + i_s \cdot 10k$$

$$\frac{v_s}{i_s} = 30k$$

$$b) \frac{v_s}{i_s} = -6k$$

1)

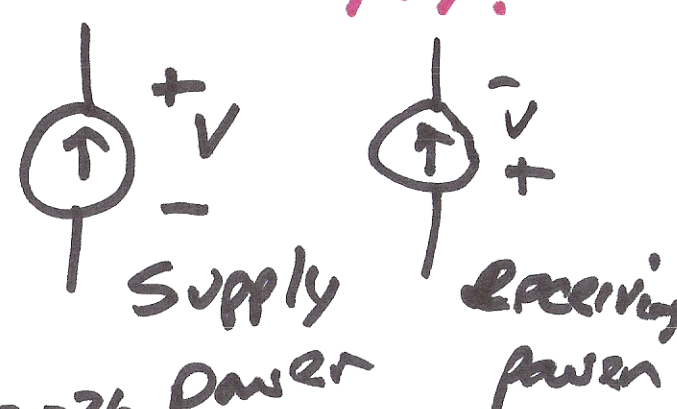
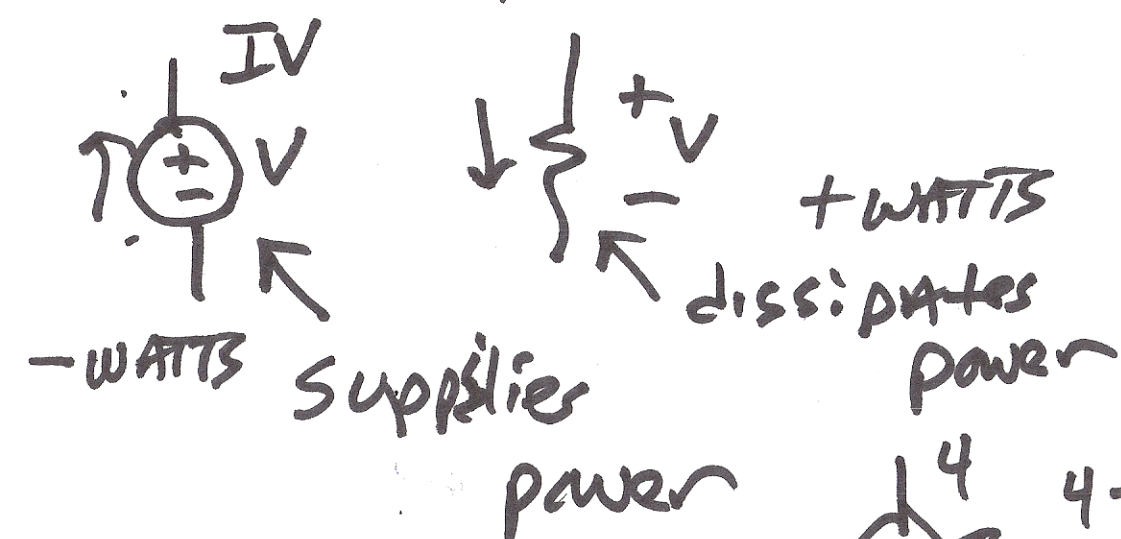


$\frac{V^2}{R} = \frac{900}{2} = \underline{\underline{450W}}$
 450
 5
 6

 461W

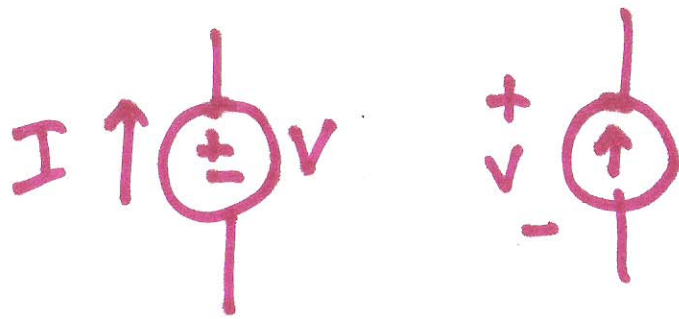
217
 208
 36

 461W yay!



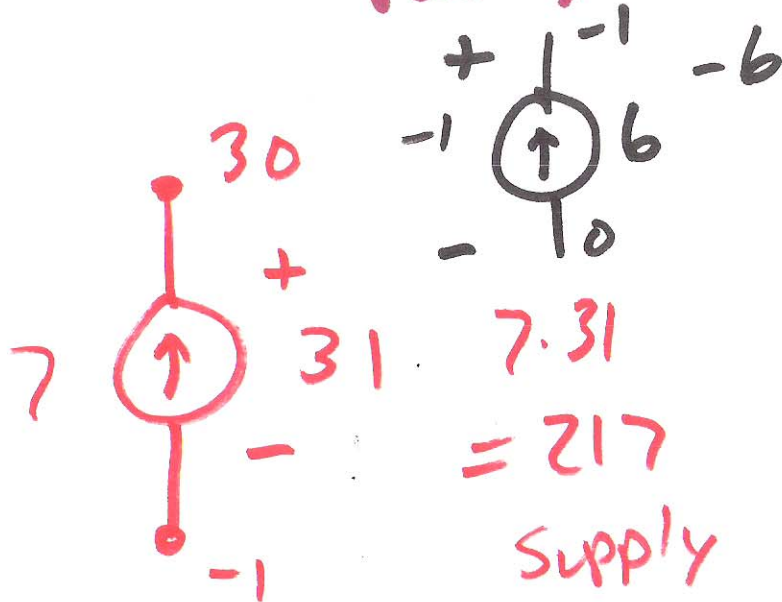
$4 - 30 = -26$ power
 $-26 \cdot 8 = -208W$

2)



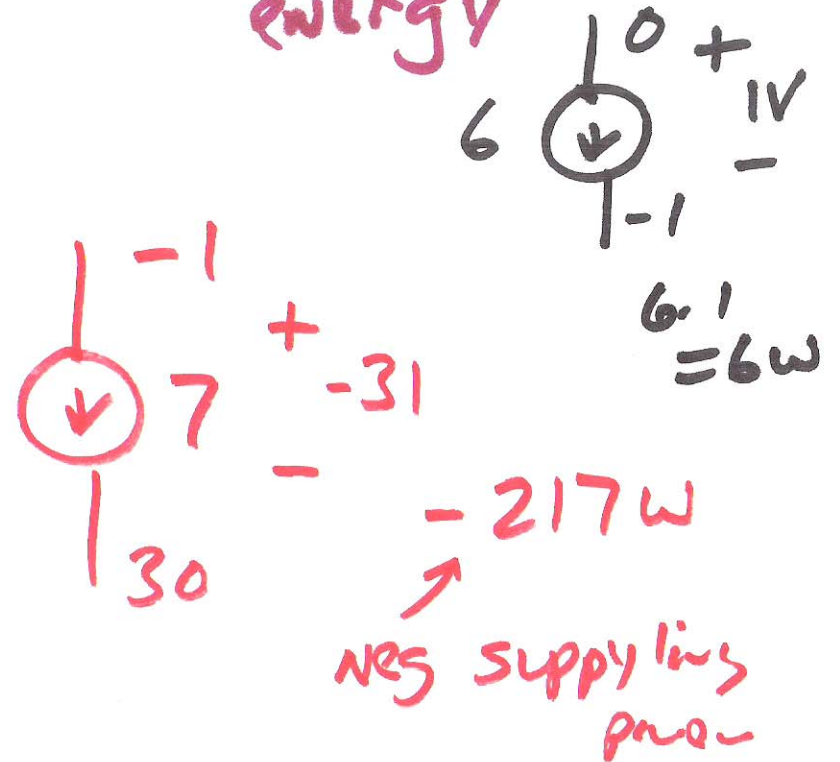
+ WATTS
(supplying power)

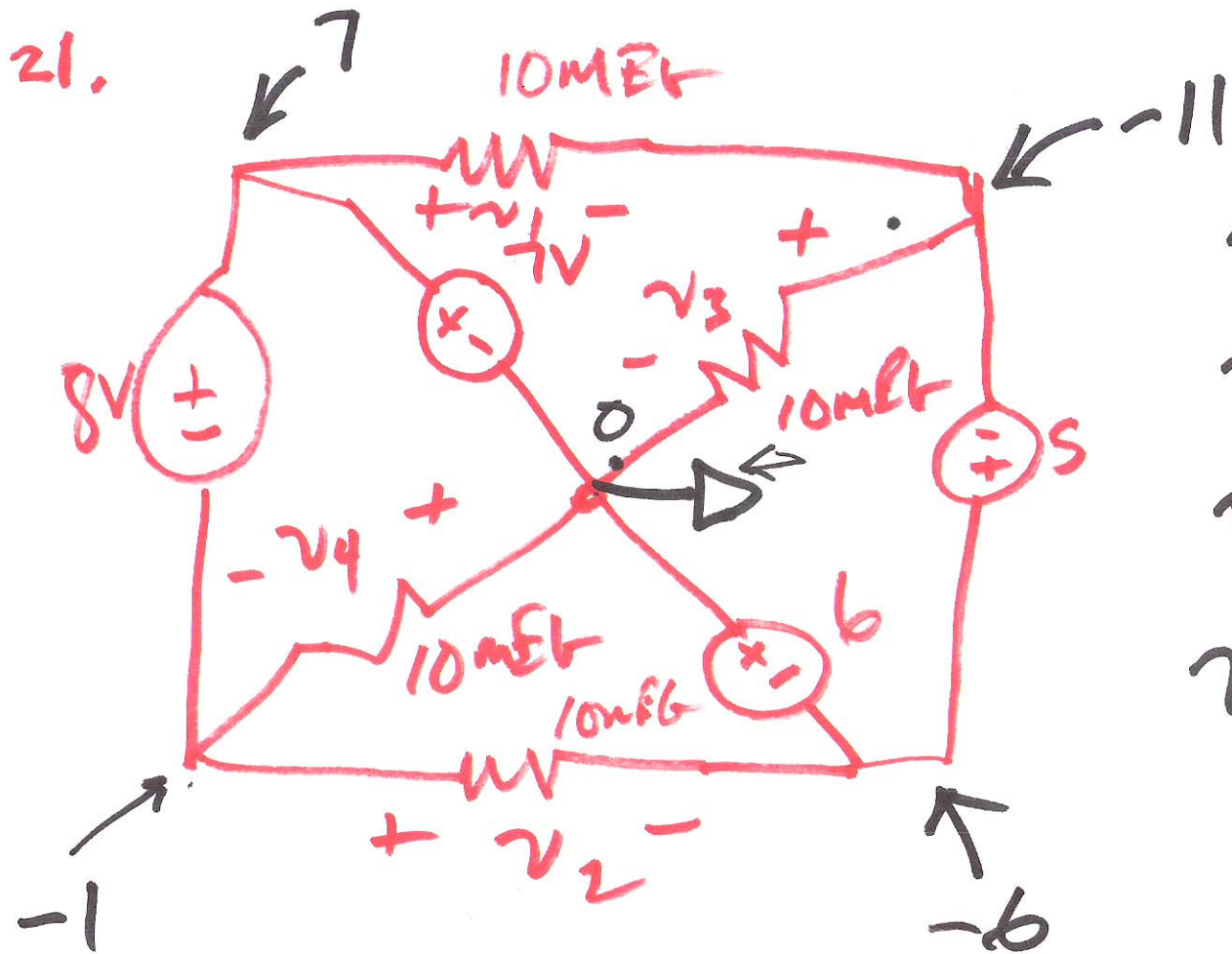
- Neg REC.



+ WATTS
Receiving energy

- Neg, supplying





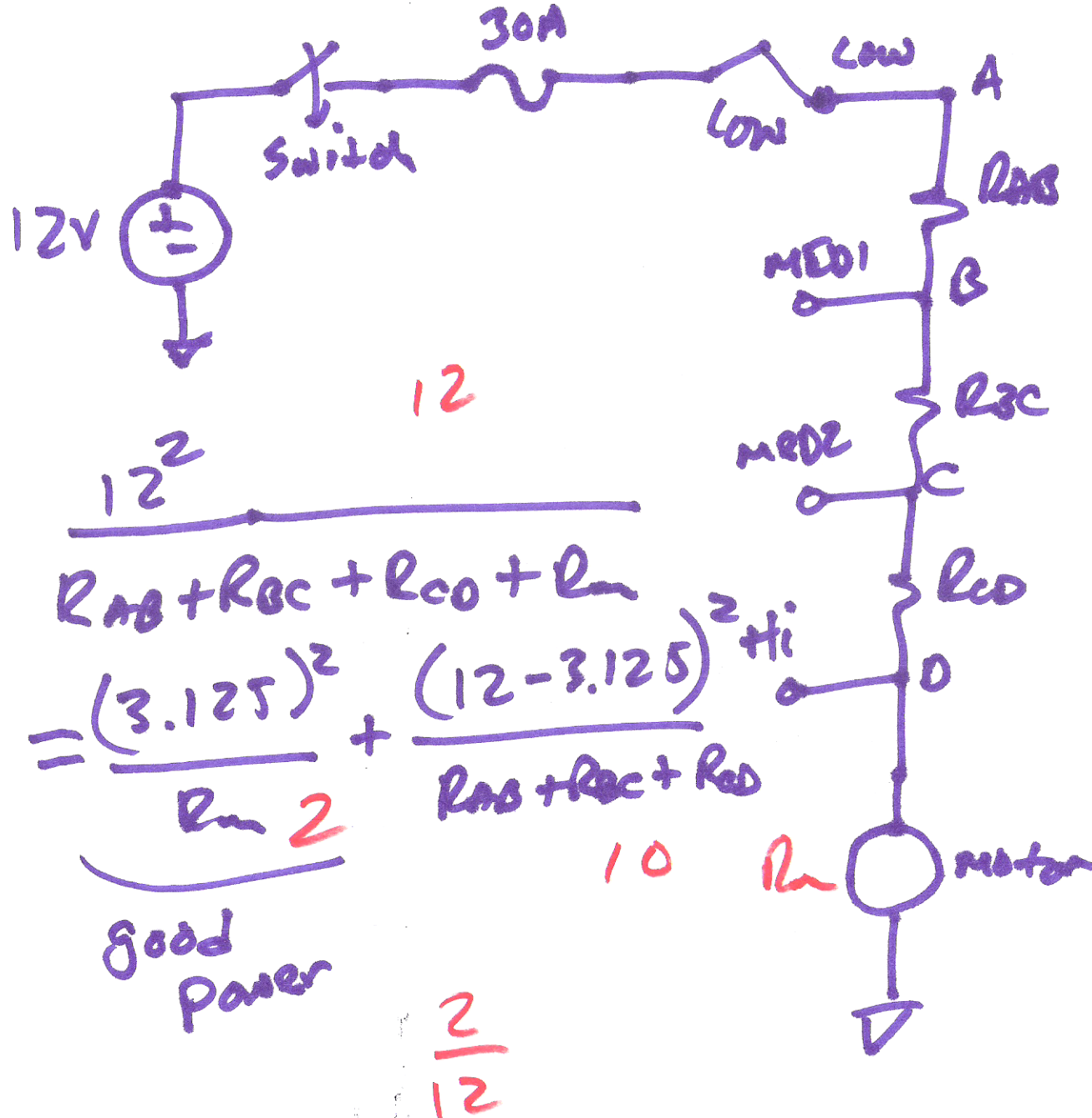
$$v_1 = 7 - (-11) = 18$$

$$v_2 = -1 - (-6) = 5$$

$$v_3 = -11 - 0 = -11$$

$$v_4 = 0 - (-1) = 1$$

4)



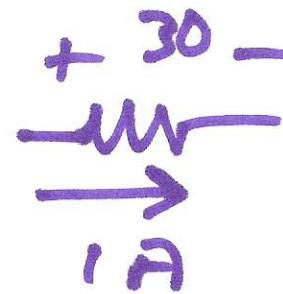
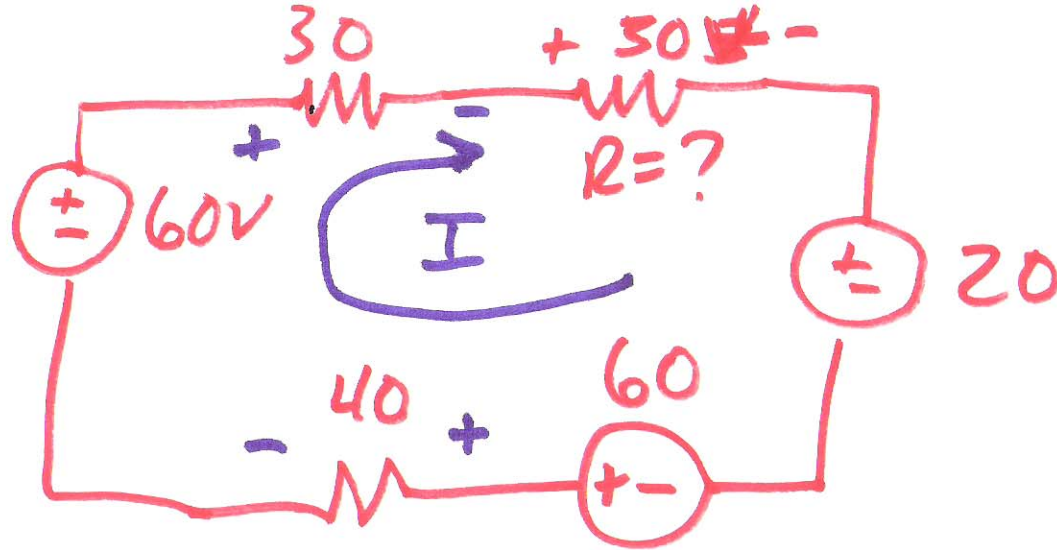
$$\frac{12}{R_{AB} + R_{BC} + R_{CD} + R_m} = 2.5A$$

$$\frac{6.75}{R_{AB}} = \frac{1.5}{R_{BC}} =$$

$$\frac{.625}{R_{CD}} = \frac{3.125}{R_m} = 2.5A$$

5)

37.



$$R = 30 \Omega$$

$$60 + \frac{6}{30} = 30I + 30 + 20 + 40I$$

$$400 = 400I$$

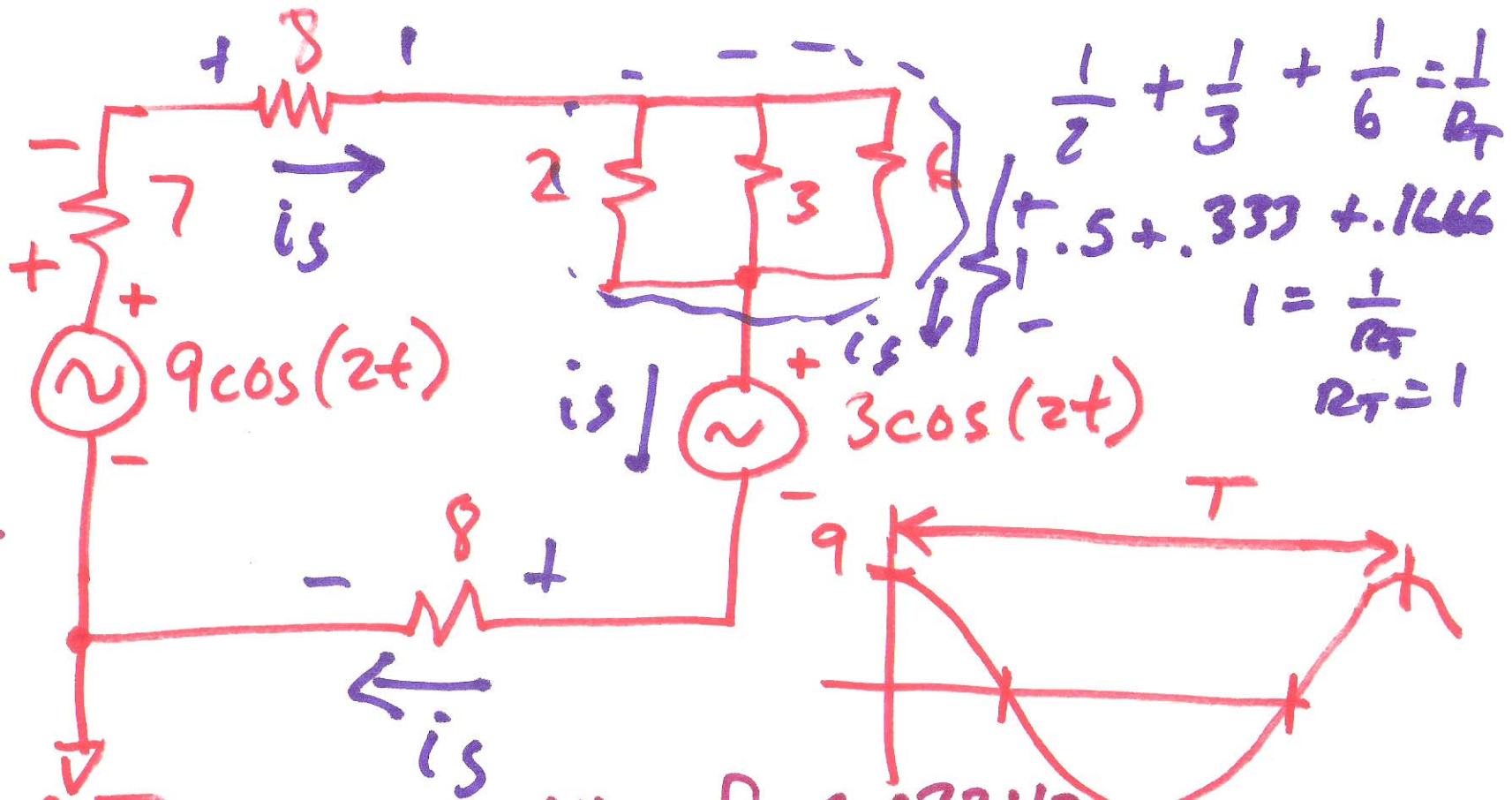
$$I = 1A$$

$$70 = 70I$$

$$I = 1A$$

6)

38.



$\cos 2\pi \cdot f \cdot T =$

$T = 31.4 \text{ s}, f = 0.032 \text{ Hz}$

$\cos \frac{2\pi \cdot t}{T} \cdot 9 \cos(2t) =$

$i_s \cdot 8 + i \cdot 7 + i_s + 3 \cos(2t) + 8 i_s$

~~$0.2 = \frac{2\pi}{T}, T = \frac{2\pi}{0.2}$~~

$6 \cos(2t) = 24 i_s$

$i_s = 0.25 \text{ A} \cos 2t$

$$\frac{(a+b)c}{7} = \frac{5 \cdot d^2}{a+1}$$

$$\frac{(a+b) \cdot c}{1} = \frac{7 \cdot 5 \cdot d^2}{a+1}$$

$$\frac{(a+b)c}{7 \cdot 5 \cdot d^2}$$

$$= \frac{1}{a+1}$$

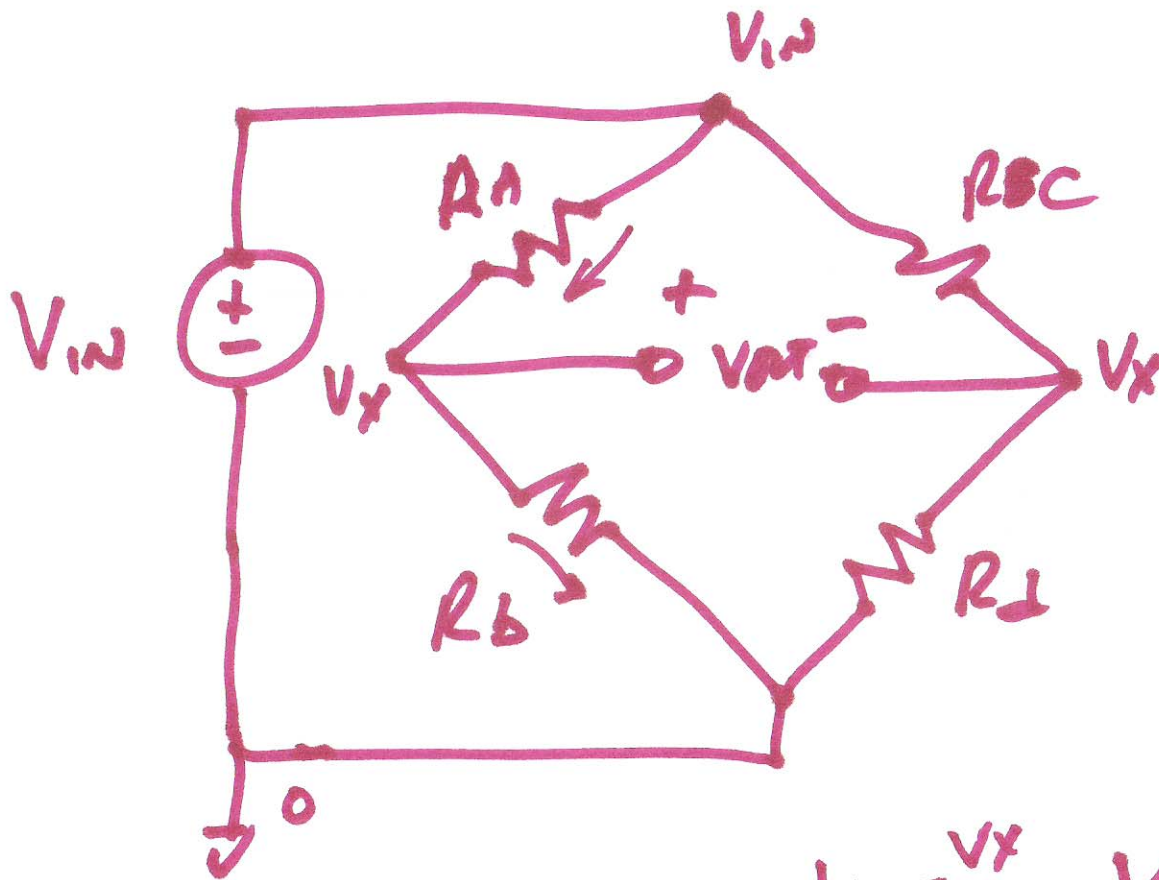
$$\frac{1}{a+b}$$

$$\frac{1}{1} = \frac{(a+b) \cdot c}{7 \cdot 5 \cdot d^2}$$
$$\frac{c}{7 \cdot 5 \cdot d^2}$$

8)

41. $R_A \cdot R_D = R_B \cdot R_C$ when $V_{OUT} = 0$

ETA KAPPA NU!



$$\frac{R_C}{R_D} = \frac{R_A}{R_B}$$

$$R_C R_B = R_A R_D$$

$$V_{IN} - V_X = \frac{R_C}{R_D} \cdot V_X$$

↑

$$\frac{V_{IN} - V_X}{R_A} = \frac{V_X}{R_B}$$

$$\frac{V_{IN} - V_X}{R_C} = \frac{V_X}{R_D}$$

$$V_{IN} - V_X = V_X \cdot \frac{R_A}{R_B}$$

9)