

P₆₈ 2. (a) 4 (b) 7 (c) 6

P₆₈ 4. (a) 6 (b) Yes, Not a loop; (c) Yes, Not a loop.

P₆₉ 7. (a) $i_A + i_B = i_C + i_D + i_E$
 $\Rightarrow i_B = 3 - 2 + 0 - 1 = 0(A)$
(b) $i_E = i_A + i_B - i_C - i_D = -2 + 1 + 1 = 0(A)$

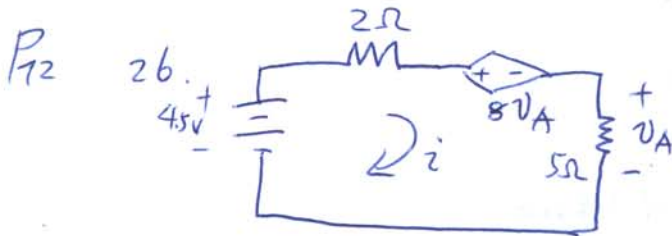
P₆₉ 9. $7A = i_2 + 1A - 3A$
 $i_2 = 9A$

P₆₉ 12. $I_C = 150 I_B = 150 \times 100 \mu A = 15 mA$
 $I_B = 100 \mu A = 0.1 mA$
 $I_E = I_C + I_B = 15.1 mA$

P₇₁ 18(b) $10V + 2i - 1.5V - 1.5V + 2i + 2i + 2V - 1V + 2i = 0$
 $8i = 0$
 $i = -1A$

P₇₁ 19. $4V - 23V + V_R = 0 \Rightarrow V_R = 19V$

$$-V_R + 12V + V_3 - V_2 - 1.5V + V_1 = 0 \Rightarrow V_2 = -4V$$



$$5i = -v_A \Rightarrow v_A = -5i$$

$$-4.5 + 2i + 8v_A - v_A = 0$$

$$7v_A + 2i = 4.5$$

$$\begin{aligned} v_A &= -5i \\ \implies i &= -0.1364A \end{aligned}$$

$$v_A = -5i = 0.6818V$$

for element from left to right :

the power absorbed :

$$-4.5 \times (-0.1364) = 0.6138W = 613.8mW$$

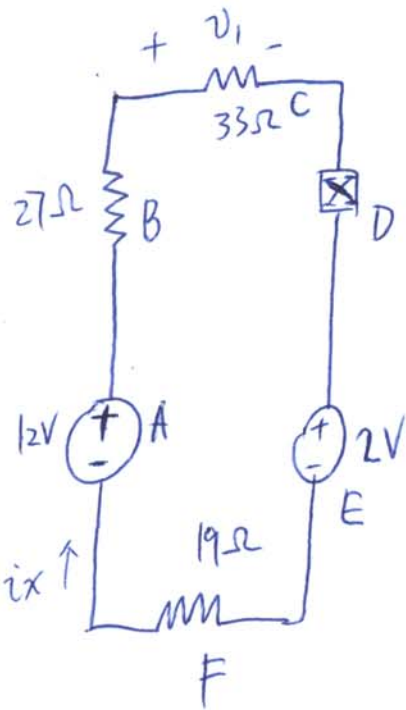
$$(-0.1364)^2 \times 2W = 37.21mW$$

$$8 \times 0.6818 \times (-0.1364) = -0.7440W = -744mW$$

$$(-0.1364)^2 \times 5W = 93mW$$

$$P_{72} \quad 28. (a)$$

$$X = 13 \Omega,$$



$$-12 + 27i_x + \overset{33i_x}{\cancel{12}} + 13i_x + 2 + 19i_x = 0$$

$$92i_x = 10$$

$$i_x = 0.1087 \text{ (A)}$$

$$P_A = -12 \times 0.1087 = -1.3044 \text{ (W)}$$

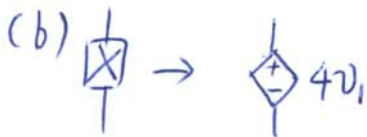
$$P_B = i_x^2 \times 27 = 0.3190 \text{ (W)}$$

$$P_C = i_x^2 \times 33 = 0.3899 \text{ (W)}$$

$$P_D = i_x^2 \times 13 = 0.1536 \text{ (W)}$$

$$P_E = 4i_x = 2 \times 0.1087 = 0.2174 \text{ (W)}$$

$$P_F = i_x^2 \times 19 = 0.2245 \text{ (W)}$$



$$\begin{cases} -12 + 27i_x + 33i_x + 4v_1 + 2 + 19i_x = 0 \\ v_1 = 33i_x \end{cases}$$

$$\Rightarrow v_1 = 1.564 \text{ V} \\ i_x = 0.0474 \text{ A}$$

$$P_A = -12 \times 0.0474 = -0.5688 \text{ W}$$

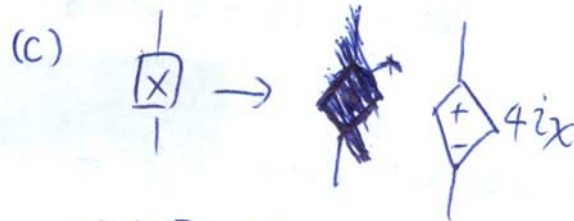
$$P_B = i_x^2 \times 27 = 0.0607 \text{ W}$$

$$P_C = i_x^2 \times 33 = 0.0741 \text{ W}$$

$$P_D = 4v_1 \times i_x = 0.2965$$

$$P_E = 2 \times i_x = 0.0948 \text{ W}$$

$$P_F = i_x^2 \times 19 = 0.0427 \text{ W}$$



$$-12 + 27i_x + 33i_x + 4i_x + 2 + 19i_x = 0$$

$$\Rightarrow 83i_x = 10$$

$$i_x = 0.1205 \text{ A}$$

$$P_A = -12 \times 0.1205 = -1.4460 \text{ W}$$

$$P_B = i_x^2 \times 27 = 0.3920 \text{ W}$$

$$P_C = i_x^2 \times 33 = 0.4792 \text{ W}$$

$$P_D = 4i_x \times i_x = 0.0581 \text{ W}$$

$$P_E = 2 \times i_x = 0.2410 \text{ W}$$

$$P_F = i_x^2 \times 19 = 0.2759 \text{ W}$$