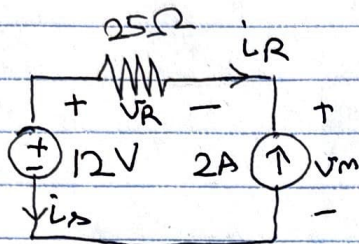


TEXTBOOK Q 2.6-5



Given,

$$V_R + V_M = 12V$$

$$I_S = -I_R = 2A$$

$$V_R = 25I_R$$

— (1)

— (2)

— (3)

(a) To find: V_M

Subs (2) in (3) to get V_R :

$$V_R = 25(-2A) = -50V$$

— (4)

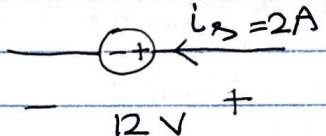
Subs (4) in (1)

$$-50V + V_M = 12V$$

$$\Rightarrow V_M = 12V + 50V = 62V$$

$$\therefore V_M = 62V$$

(b) (i) For 12V source,



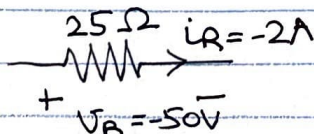
Since this is in passive convention,

$$\text{Power received by element, } P_R = V \cdot I$$

$$= (12V)(2A) = 24W$$

$$\text{Power supplied} = -P_R = -24W$$

(ii)



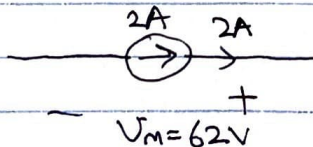
Since in passive convention,

$$\text{Power received by element, } P_R = V \cdot I$$

$$= (-50V)(-2A) = 100W$$

$$\therefore \text{Power supplied} = -\text{Power received} = -100W$$

(iii)



This is NOT in passive convention.

$$\therefore \text{Power supplied by element} = (62V)(2A)$$

$$= 124W$$