

1. Do Problem 3.61.

Problem 2.

(a) Draw the driving-point characteristics for the two circuits shown in Fig. a and b. The two nonlinear resistors are described by the v - i characteristics shown in Fig. c and d, respectively.

(b) Will the driving-point characteristic obtained in (a) change if the terminals of \mathcal{R}_1 are turned around? Explain.

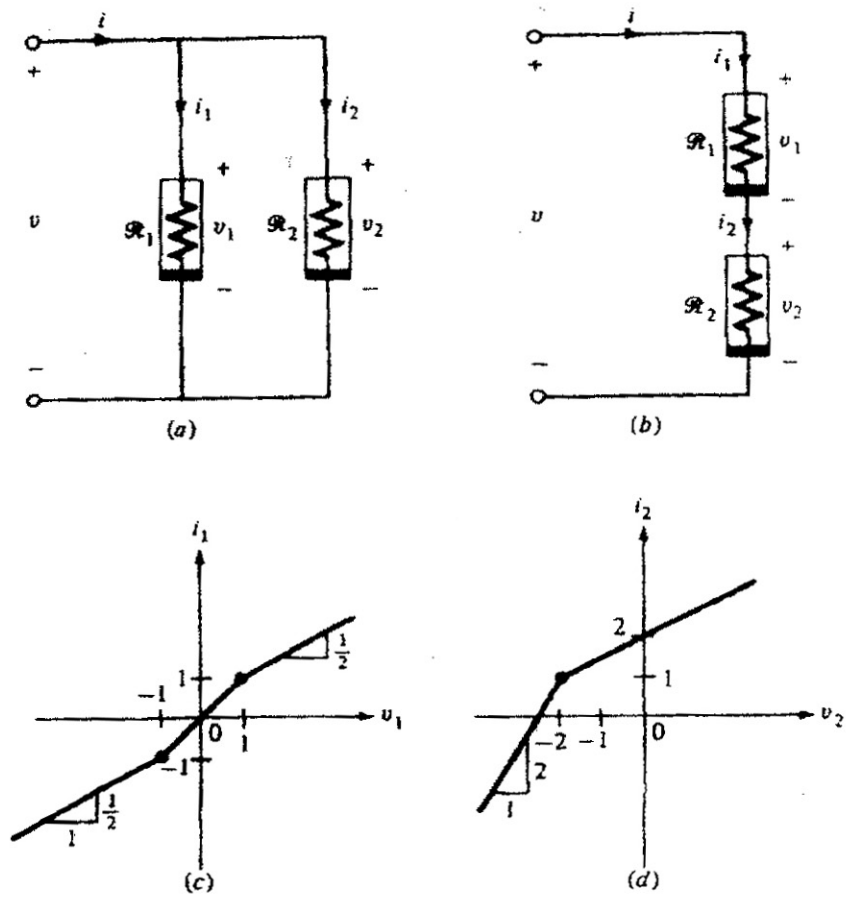


Figure 1

Problem 3.

Use graphic series and parallel addition to derive the driving-point characteristics of the one-ports shown in Fig. 2.

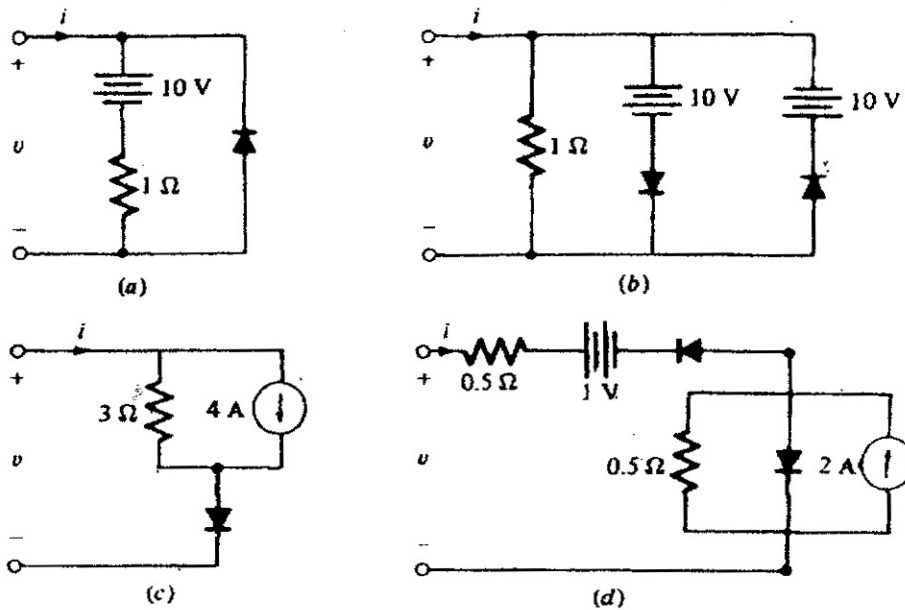


Figure 2.

Problem 4.

The zener-diode circuit shown in Fig. 3 (a) functions as an inexpensive voltage regulator which maintains a constant output voltage when the load resistance R_L and/or power supply voltage E change within a prescribed range.

(a) Assuming an ideal zener-diode v - i characteristic with $E_z = 5$ V (see Fig. 3 (b)), find (by the graphic method) the driving-point characteristic of the one-port N .

(b) Using the driving-point characteristic from (a), find the output voltage v_o when $R_L = 2$ k Ω and $R_L = 500$ Ω , respectively.

(c) If E can vary by ± 5 percent, specify the allowable range of R_L in order to maintain a constant 5 V output voltage.

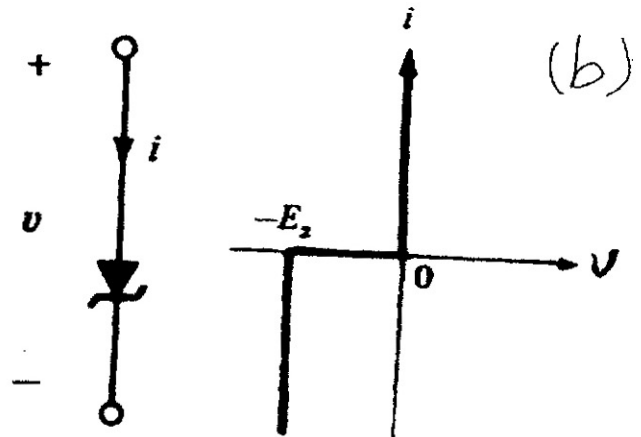
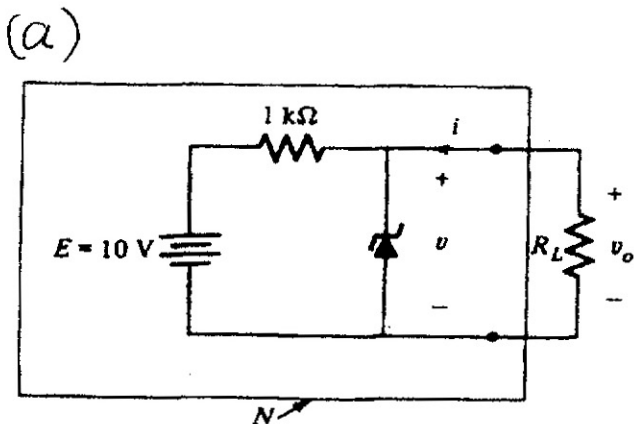


Figure 3