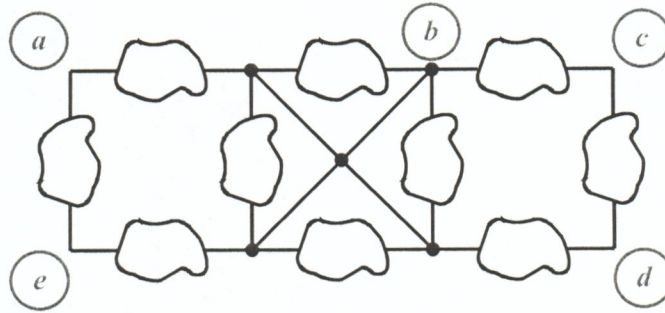# Problem #11

Several of the nodes in the circuit shown below are labeled.

If $V_{ab} = 10$ V, $V_{ac} = 5$ V, $V_{ae} = 1$ V and $V_{db} = 3$ V :

a. Determine V_{ad}.

$$V_{ad} = V_{ab} + V_{bd} = V_{ab} - V_{db} = 10V - 3V = 7V$$

b. Determine V_{dc}.

$$V_{dc} = V_{db} + V_{ba} + V_{ac} = V_{db} - V_{ab} + V_{ac}$$
$$= 3V - 10V + 5V = -2V$$

c. Determine V_{bd}.

$$V_{bd} = -V_{db} = -3V$$

d. Determine V_{ce}.

$$V_{ce} = V_{ca} + V_{ae} = -V_{ac} + V_{ae} = -5V + 1V = -4V$$

e. Determine V_{de}.

$$V_{de} = V_{db} + V_{ba} + V_{ae}$$
$$= V_{db} - V_{ab} + V_{ae}$$
$$= 3V - 10V + 1V$$
$$= -6V$$