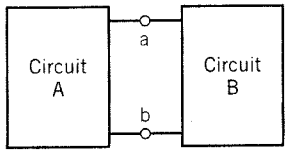
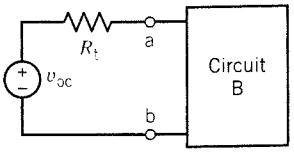
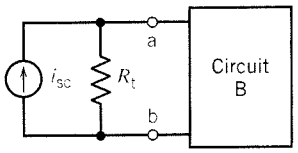
Table 5.11-2 Thévenin and Norton Equivalent Circuits

ORIGINAL CIRCUIT	THÉVENIN CIRCUIT	NORTON EQUIVALENT CIRCUIT
		

PROBLEMS

Section 5.3 Source Transformations

P 5.3-1 The circuit shown in Figure P 5.3-1*a* has been divided into two parts. The circuit shown in Figure P 5.3-1*b* was obtained by simplifying the part to the right of the terminals using source transformations. The part of the circuit to the left of the terminals was not changed.

(a) Determine the values of R_t and v_t in Figure P 5.3-1*b*.

(b) Determine the values of the current i and the voltage v in Figure P 5.3-1*b*. The circuit in Figure P 5.3-1*b* is equivalent to the circuit in Figure P 5.3-1*a*. Consequently, the current i and the voltage v in Figure P 5.3-1*a* have the same values as do the current i and the voltage v in Figure P 5.3-1*b*.

(c) Determine the value of the current i_a in Figure P 5.3-1*a*.

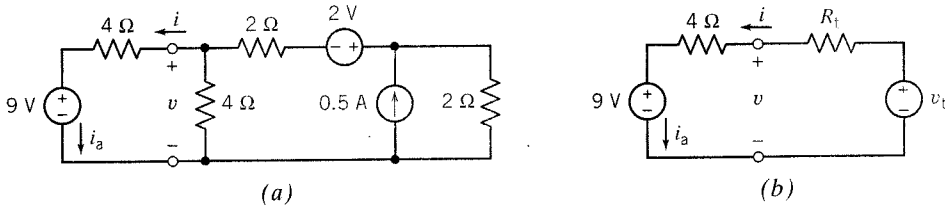


FIGURE P 5.3-1

P 5.3-2 Consider the circuit of Figure P 5.3-2. Find i_a by simplifying the circuit (using source transformations) to a single-loop circuit so that you need to write only one KVL equation to find i_a.

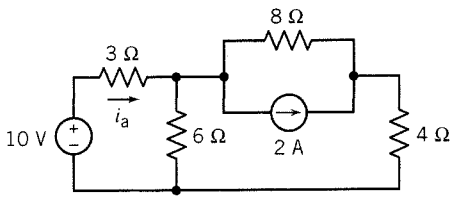


FIGURE P 5.3-2

P 5.3-3 Find v_o using source transformations if $i = 5/2$ A in the circuit shown in Figure P 5.3-3.

Hint: Reduce the circuit to a single mesh that contains the voltage source labeled v_o.

Answer: $v_o = 28$ V

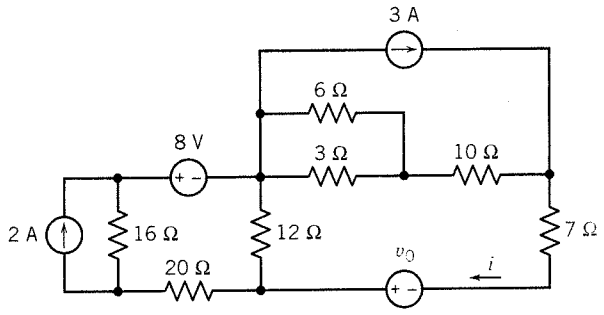


FIGURE P 5.3-3

P 5.3-4 Determine the value of the current i_a in the circuit shown in Figure P 5.3-4.

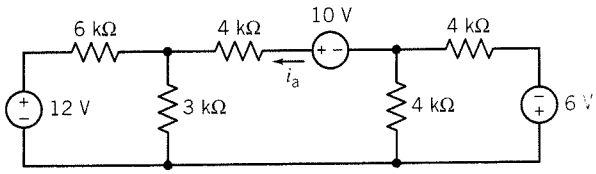


FIGURE P 5.3-4