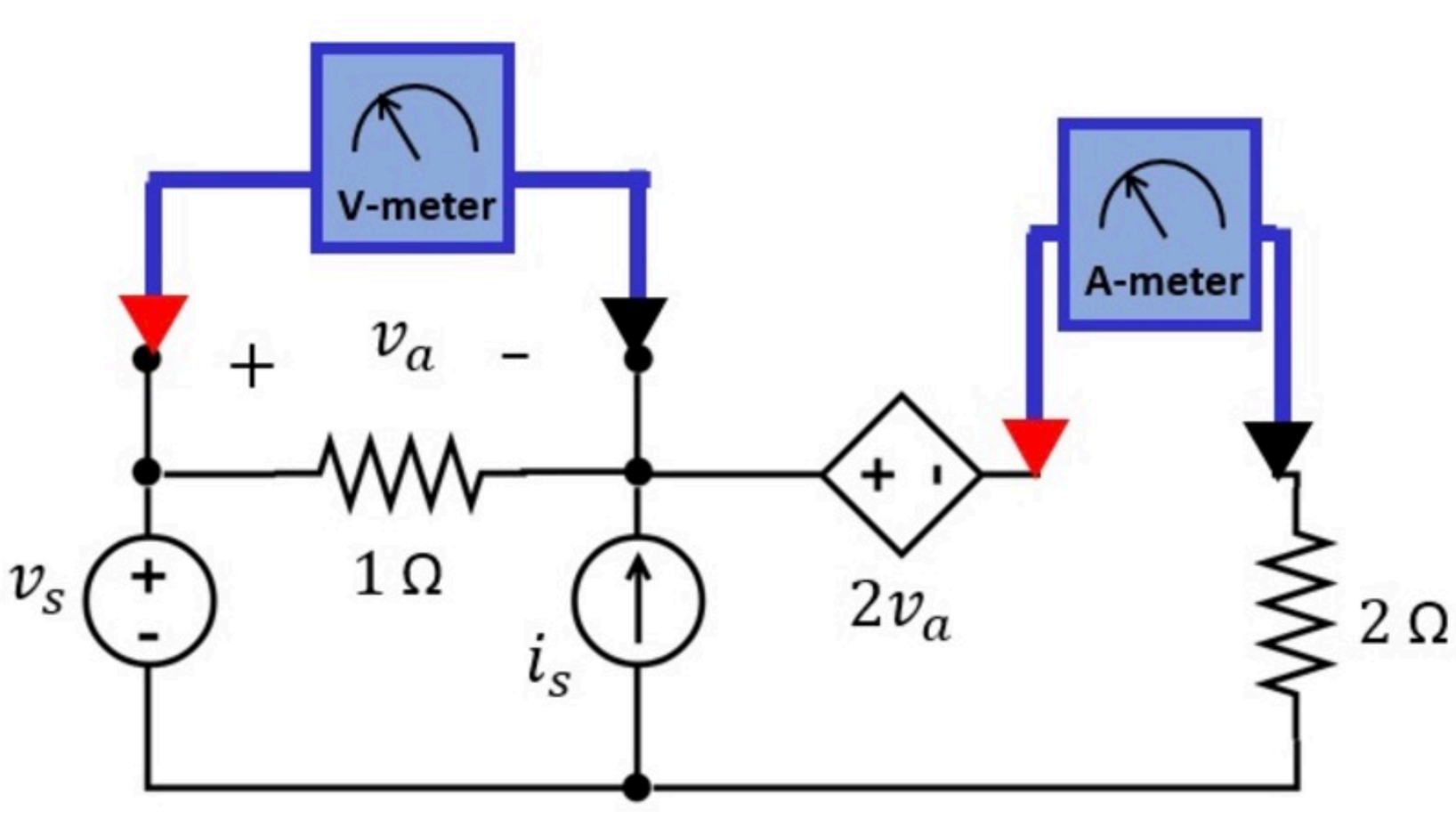
Basic concepts 009

Problem has been graded.

The reading of the voltmeter is x and that of the ammeter is y.

What is the power *P* supplied by the VCVS?
What is the value of the current source i_s?
What is the value of the voltage source v_s?



Given Variables:

x : 3 V

y : 5 A

Calculate the following:

P (W) :

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i_s (A) :

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v_s (V) :

The reading of the voltmeter is x and that of the ammeter is y.

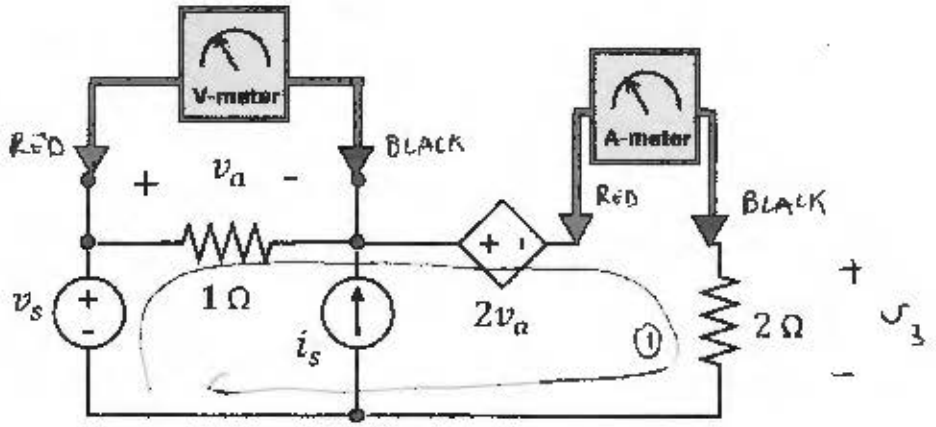
What is the power P supplied by the VCVS?

What is the value of the current source i_s?

What is the value of the voltage source v_s?

X = 6 V

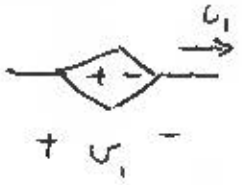
Y = 3 A



(a) $v_a = X = 6$

$i_1 = Y = 3$

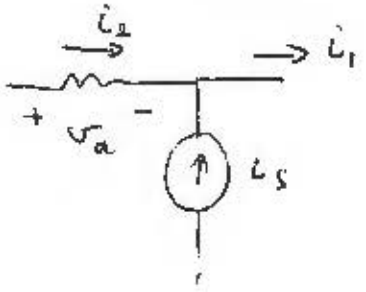
$v_1 = 2v_a = 12$



$P = v_1 \cdot i_1 = 36$ W RECEIVED

$P = -36$ W SUPPLIED

(b)



$i_1 = \frac{v_a}{1} = 6A$

KCL: $i_2 + i_s = i_1 \Rightarrow i_s = 3 - 6 = -3$

$i_s = -3A$

(c) KVL on ①:

$v_s = v_a + 2v_a + v_3$

$= 3 \cdot 6 + 6$

$= 24$

$v_3 = i_1 \cdot 2 = 6$ V

$v_s = 24$ V