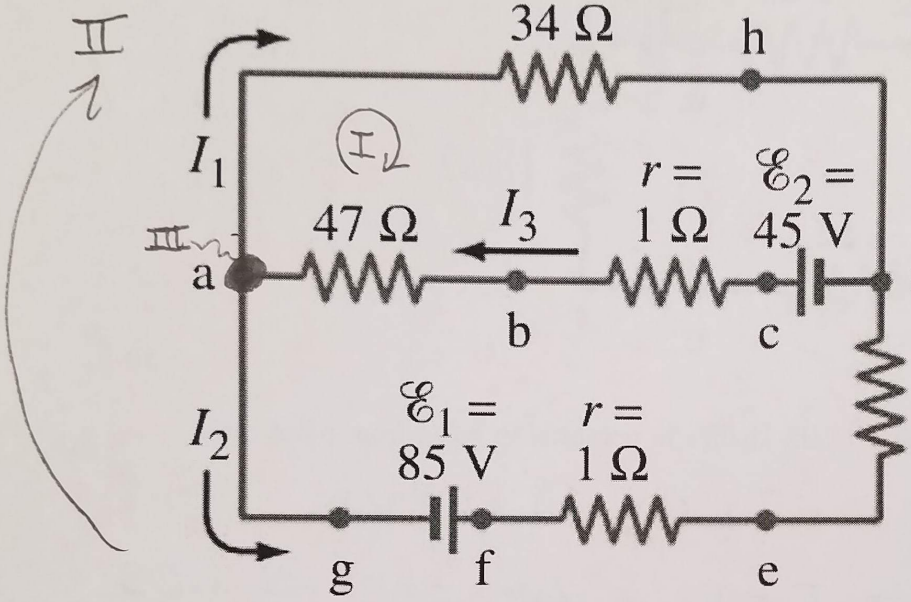
PHYSICS 122 QUIZ 4 2/21/2018

NAME: Key SECTION:

Refer to the circuit below for questions 1-4.



$$\text{I}: \quad -34I_1 + 45 - (47+1)I_3 = 0$$
$$\Rightarrow I_3 = \frac{-34I_1 + 45}{48}$$

$$\text{II}: \quad -34I_1 + (18+1)I_2 - 85 = 0$$
$$\Rightarrow I_2 = \frac{85 + 34I_1}{19}$$

$$\text{III}: \quad I_3 = I_1 + I_2$$
$$\Rightarrow \frac{-34I_1 + 45}{48} = I_1 + \frac{85 + 34I_1}{19}$$
$$\Rightarrow I_1 = \frac{\frac{45}{48} - \frac{85}{19}}{1 + \frac{34}{48} + \frac{34}{19}}$$

$$\simeq -1.01 \text{ Amp}$$

1. What value is closest to I_1? Sign is taken relative to depicted direction.

a) 0.5A

● -1A

c) +1A

d) -0.5A

e) +2A

1. What value is closest to I_2? Sign is taken relative to depicted direction.

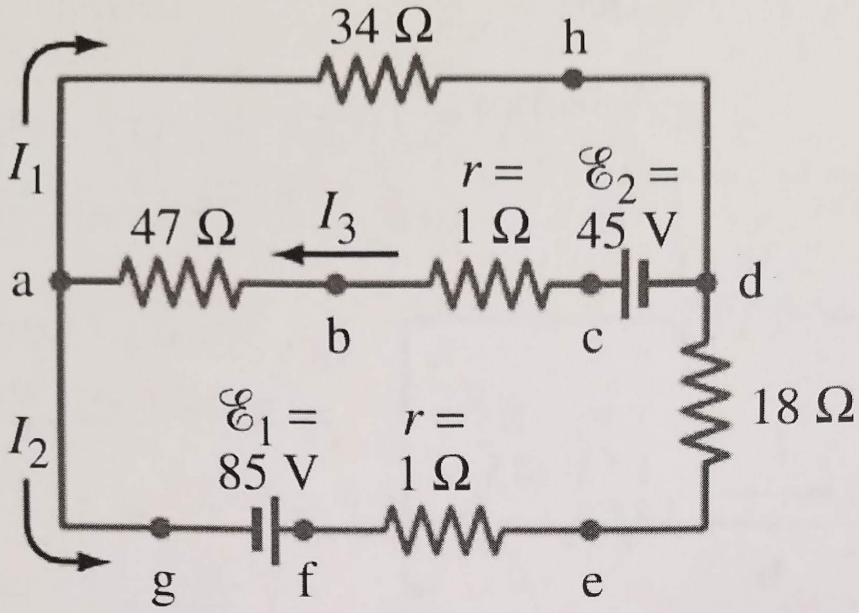
● 2.5A

$$I_2 = \frac{85 + 34(-1.01)}{19} \simeq 2.66 \text{ A}$$

b) -2.5A

c) 1.7A

d) -1.7A



1. Which of the following is closest to the change in potential in going from point d to point a?

$V_{d\to a} = -I_3(48\,\Omega) + 45$ Volts

$I_3 = I_1 + I_2 = 2.66 - 1.01 \simeq 1.65$

$V_{d\to a} = -1.65(48) + 45 \simeq -34.2$ Volts

a) -34V

b) +34V

c) -16V

d) +48V

e) +2V

1. Which of the following is closest to the terminal voltage of the 85V battery?

$V_{\text{Terminal}} = V_{g\to e} = 85$ Volts $- I_2(1\,\Omega)$

$= 85 - 2.66 = 82.34$ Volts

a) 84V

b) 82V

c) 78V

d) 62V

e) 96V