

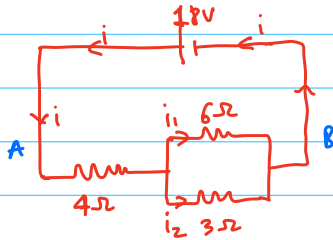
Discussion 1

Problem 1

Current passing through a wire decreases linearly from 10A to 0 in four seconds. Find the total charge flowing through the wire in the given time interval.

Problem 2

a) Compute the equivalent resistance of the combination of resistors (across A & B) shown in the figure and find current i drawn from the battery.



- b) In the previous question, find the currents (i_1 & i_2) flowing through 6Ω & 3Ω resistors.
- c) Find the input resistance of an ideal voltage source & an ideal current source.

Problem 3

If $\frac{dy}{dt} = 2(25-y)$, find $y(t)$. Assume that $y(0)=40$.

Problem 4

Assume $Y = 3 \cos \theta + 4 \sin \theta$. If Y can be expressed as $A \sin(\theta + \beta)$, find A and β .

Problem 5

- a) Plot the complex number $z = -\sqrt{3} + i$ in the complex plane and then write it in its polar form.
- b) Write the complex number $z = 5e^{i\pi/3}$ in rectangular form & plot it in the complex plane.

Problem 6

Assume the solution for the following equation is represented by an exponential function ($A_1 e^{s_1 t}$), determine the values of A_1 & s_1 . Assume that $i(0) = I_0$.

$$\frac{di}{dt} + R \frac{i}{L} = 0$$

Problem 7

Assume that a time varying voltage $V_0 e^{-2t}$ is applied across a resistor. What will be the energy dissipated across the resistor?

