Quiz #1 Q.1

Q.1) Referring to the circuit shown in Figure Q.1, count the number of nodes: [2-Points]


5 Ω   2 Ω   5 Ω   4 Ω   4 Ω   5 A

Number of nodes = 3
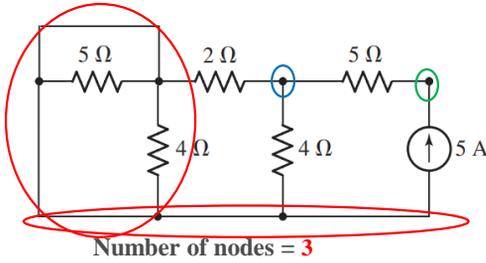
1

Quiz #1 Q.2

Q.2) In the circuit shown in Figure Q.2, find v_{10}, v_A, and the power of the dependent source if $V_s = 100$ volts. [3-Points]

10 Ω V_s $+ v_{10} -$ $8v_A$ 10 Ω v_A i_x
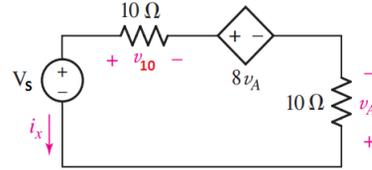
2

Quiz #1 Q.3

Q.3) Find the current i_1, the current i_2, and the voltage v_3 in the circuit shown in Figure Q.3. [5-Points]

100 A   30 Ω   30 Ω   100 Ω   30 Ω   30 Ω i_1 v_3 i_2

4
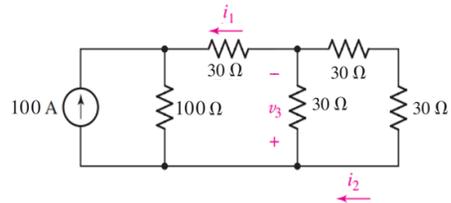
$+ 100 + VA - 8VA + 10ix = 0$

$100 - 7VA + 10ix = 0$ $\boxed{VA = 10x}$

$100 - 70ix + 10ix = 0$

$100 = 60ix \Rightarrow ix = \frac{100}{60} = 1.6667\ A$

$VA = 10\ ix = 10(1.6667) = 16.667\ V$

$V_{10} = -ix(10) = -16.667V$

$P = VI = (-8VA)(ix) = -222.27\ w$

100 A   30 Ω   30 Ω   100 Ω v_3 30 Ω   30 Ω i_1 i_2
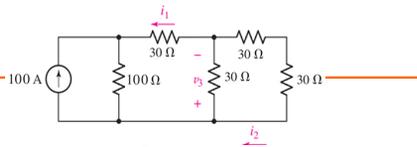
100A   30   100   30   60 = 30+30

$60 // 30 = 20$

$30 + 20 = 50$

100A $v i_1$ i_2 60   50

$i_{100\Omega} = 100 \times \frac{50}{150} = 33.33\ A$

$i_{50} = 100 - 33.33$ or $100 \times \frac{100}{150} = 66.66\ A$

100 A   30 Ω   30 Ω   100 Ω v_3 30 Ω   30 Ω i_1

30   60 $i_{60} = 66.66 \times \frac{30}{90}$

$i_{60} = 22.22\ A$

$i_{30} = 66.66 - 22.22 = 44.44\ A$

100A   33.33A V_3 44.44   60 i_1 i_2 22.22A   30

$i_1 = -66.66\ A$ $i_2 = 22.22A$

$V_3 = 30 \times 44.44 = -1333.2V$

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