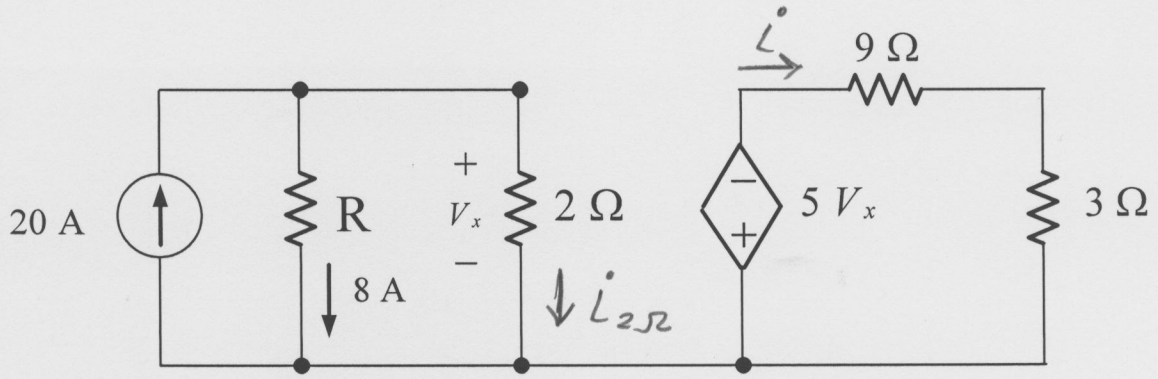
EE 202-01 – Winter 2013(122)

Quiz 1

SER	ID	NAME	KEY



For the circuit shown above find :

(a) The resistor R ?

(b) The power deliver by the independent source ?

(c) The power deliver by the dependent source ?

(a) KCL : $20 = 8 + i_{2\Omega} \Rightarrow i_{2\Omega} = 12$ A

$\Rightarrow V_x = 2(i_{2\Omega}) = 2(12) = 24$ V

$\Rightarrow 24 = R(8) \Rightarrow R = 3\Omega$

(b) $P^{absorbed}_{20\,A} = -V_x(20) = -(24)(20) = -480$ W

$\Rightarrow P^{delivered}_{20A} = 480$ W

(c) KVL : $5V_x + 9i + 3i = 0 \Rightarrow i = -10$ A

$P^{absorbed}_{5V_x} = (5V_x)(i) = 5(24)(-10)$

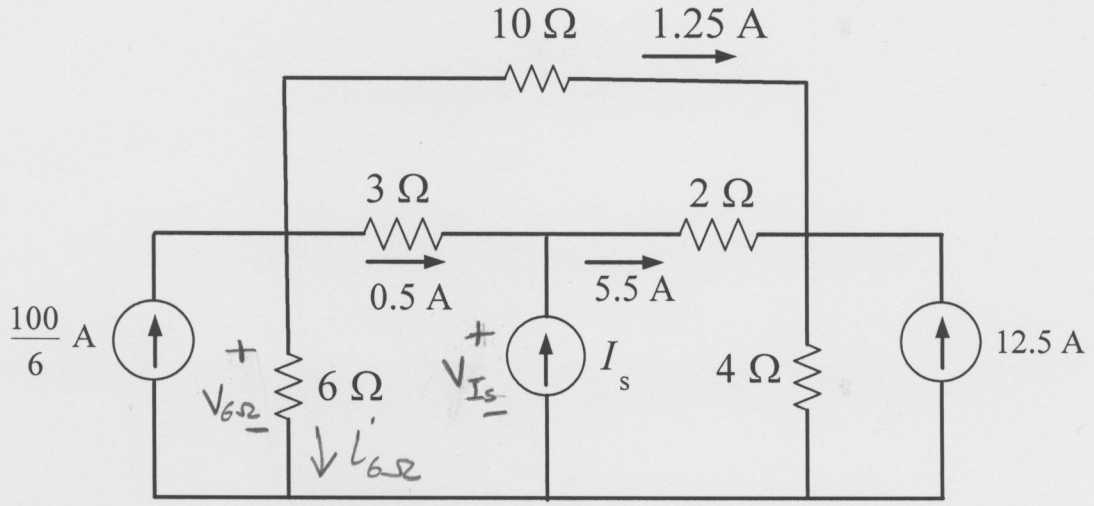
$= -1200$ W

$\Rightarrow P^{deliver}_{5V_x} = 1200$ W

EE 202-02 – Winter 2013(122)

Quiz 1

SER	ID	NAME	KEY



For the circuit shown above find :

(a) The power deliver by the $\frac{100}{6}$ A independent current source ?

(b) The power deliver by the I_s independent current source ?

(a) KCL: $\frac{100}{6} = i'_{6\Omega} + 0.5 + 1.25 \Rightarrow i'_{6\Omega} = 14.92$ A

$V_{6\Omega} = 6\, i'_{6\Omega} = 6(14.92) = 89.5$ V

$P^{absorbed}_{\frac{100}{6}A} = -V_{6\Omega}\left(\frac{100}{6}\right) = -(89.5)\left(\frac{100}{6}\right) = -1491.67$ W

$\Rightarrow P^{deliver}_{\frac{100}{6}A} = 1491.67$ W

(b) KCL: $0.5 + I_s = 5.5 \Rightarrow I_s = 5$ A

KVL: $-V_{6\Omega} + 3(0.5) + V_{I_s} = 0 \Rightarrow V_{I_s} = 88$ V

$P^{absorbed}_{I_s} = -(V_s)(I_s) = -(88)(5) = -440$ W

$\Rightarrow P^{deliver}_{I_s} = 440$ W