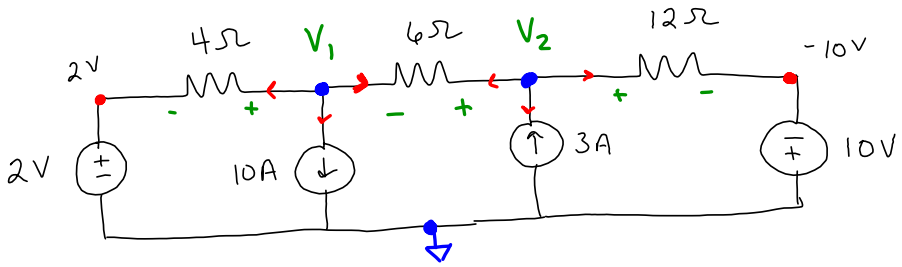


node 1: $10 + \frac{V_1 - 2}{4} + \frac{V_1 - V_2}{6} = 0$

node 2: $-3 + \frac{V_2 - (-10)}{12} + \frac{V_2 - V_1}{6} = 0$

node 1: $V_1\left(\frac{1}{4} + \frac{1}{6}\right) + V_2\left(-\frac{1}{6}\right) = \frac{2}{4} - 10$

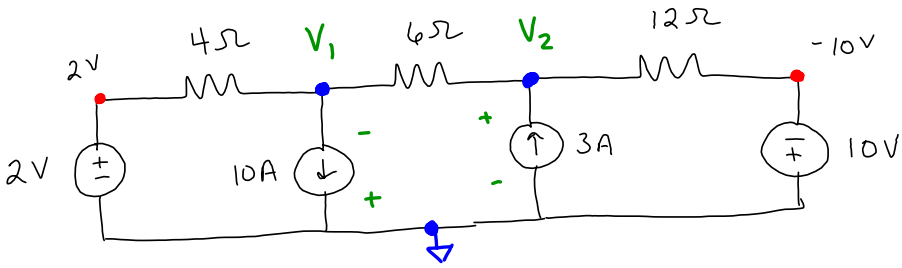
$V_1(.417) + V_2(-0.167) = -9.5$

node 2: $V_1\left(-\frac{1}{6}\right) + V_2\left(\frac{1}{12} + \frac{1}{6}\right) = 3 - \frac{10}{12}$

$V_1(-0.167) + V_2(0.25) = 2.167$

$V_1 = -26.36\text{V}$

$V_2 = -8.94\text{ V}$



$V_1 = -26.\overline{36}V$

$V_2 = -8.94V$

Sources: $P = VI$

10A: $P = (-V_1)(10) = 263.63\,W$, Del

3A: $P = (V_2)(3) = -26.36\,W$, Del

2V: $P = (2)\left(\frac{V_1 - 2}{4}\right) = -14.18\,W$, Abs or $+14.18\,W$, Del

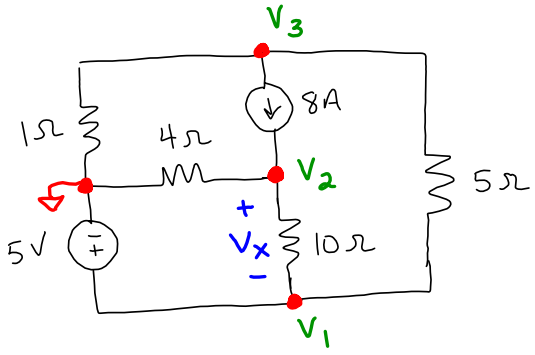
10V: $P = (10)\left(\frac{V_2 - (-10)}{12}\right) = 0.883\,W$, Del

Resistors $P = \frac{V^2}{R}$

4Ω: $P = \frac{(V_1 - 2)^2}{4} = 201.07\,W$ Abs

12Ω: $P = \frac{(V_2 + 10)^2}{12} = 0.094\,W$, Abs

6Ω: $P = \frac{(V_1 - V_2)^2}{6} = 50.58\,W$, Abs



N1 : don't need

N2 : $-8 + \frac{V_2}{4} + \frac{V_2 - \cancel{V_1}^{5}}{10} = 0$

N3 : $\frac{V_3}{1} + 8 + \frac{V_3 - \cancel{V_1}^{5}}{5} = 0$

$P = VI = (5)(?)$

We need N1 equation

Using nodal analysis, solve for V_x and the power delivered by 5 Volt source.

We Know : $\boxed{V_1 = 5V}$

N2 : $V_2(.35) = 8.5$

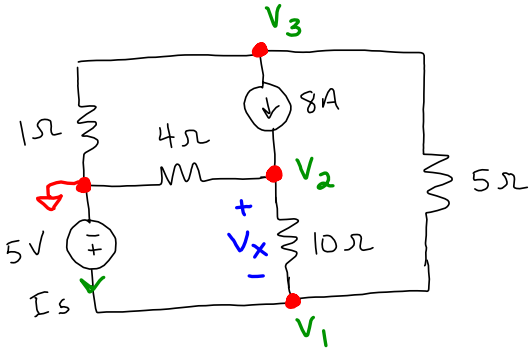
$\boxed{V_2 = 24.29V}$

N3 : $V_3(1.2) = -7$

$\boxed{V_3 = -5.83V}$

$V_x = V_2 - V_1$

$\boxed{V_x = 19.29V}$



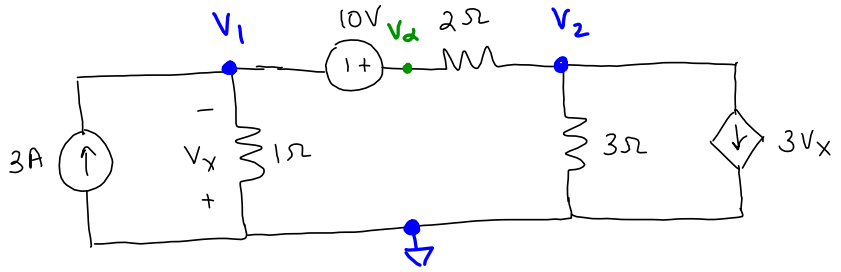
$V_2 = 24.29V$

$V_3 = -5.83V$

N1: $\frac{V_1 - V_3}{5} + \frac{V_1 - V_2}{10} + (-I_s) = 0$

$I_s = 0.237\ A$

5V: $P_{del} = (5) I_s = 1.18\ W,\ Del$



Using nodal analysis, find V_x and power absorbed by 2Ω.

Know: $\boxed{V_x = -V_1}$

$$+ V_\alpha - V_1 = 10$$

$$V_\alpha = V_1 + 10$$

$$\boxed{V_x = 1.67\,V}$$

N1: $$-3 + \frac{V_1}{1} + \frac{V_1 + 10 - V_2}{2} = 0$$

N2: $3V_x$ ($-V_1$) $$+ \frac{V_2}{3} + \frac{V_2 - (V_1 + 10)}{2} = 0$$

N1: $V_1(1.5) + V_2(-.5) = -2$

N2: $V_1(-3.5) + V_2(.833) = 5$

$$\boxed{V_1 = -1.67\,V \quad V_2 = -1\,V}$$

$$P_{2\Omega} = \frac{V^2}{R}$$

$$= \frac{(V_1 + 10 - V_2)^2}{2}$$

$P_{2\Omega} = 43.55$ W ABS

Quiz 2: Nodal Analysis

Wednesday 2/5