ELEMENTS OF ELECTRICAL ENGINEERING

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Numerical Examples on Source Transformation

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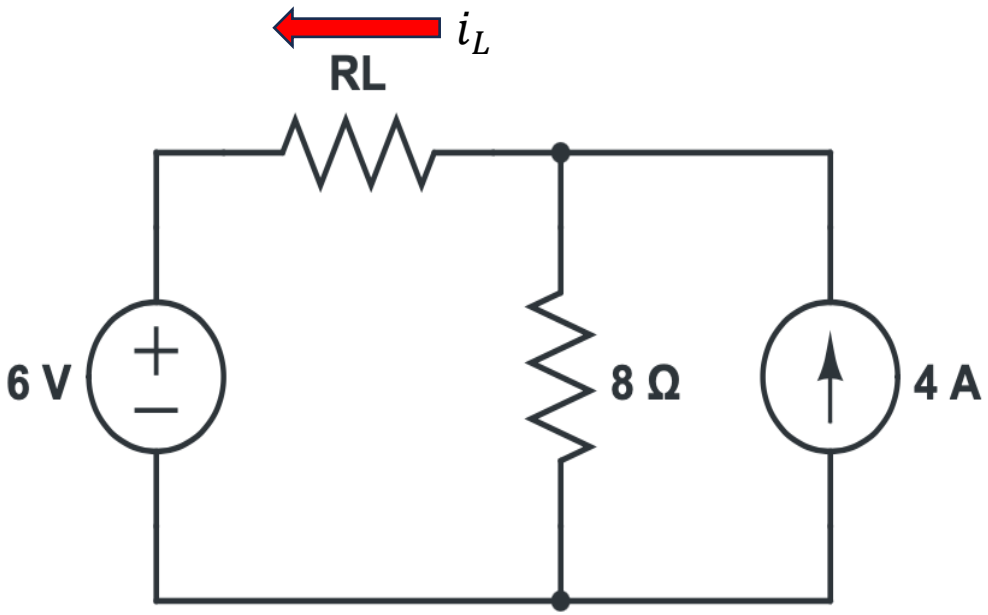
Source Transformations – Numerical Example 1

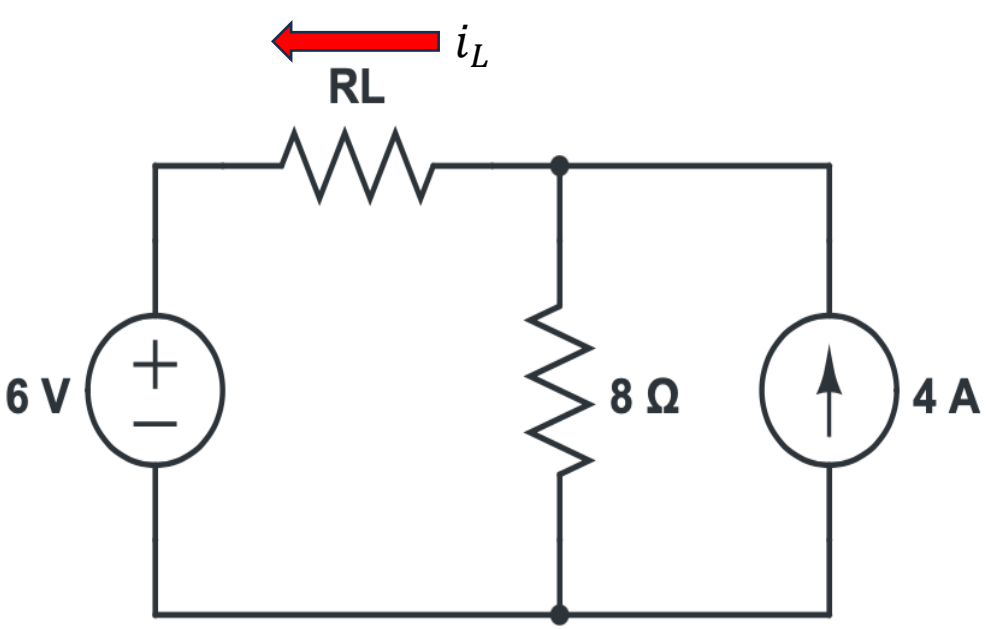
Question:

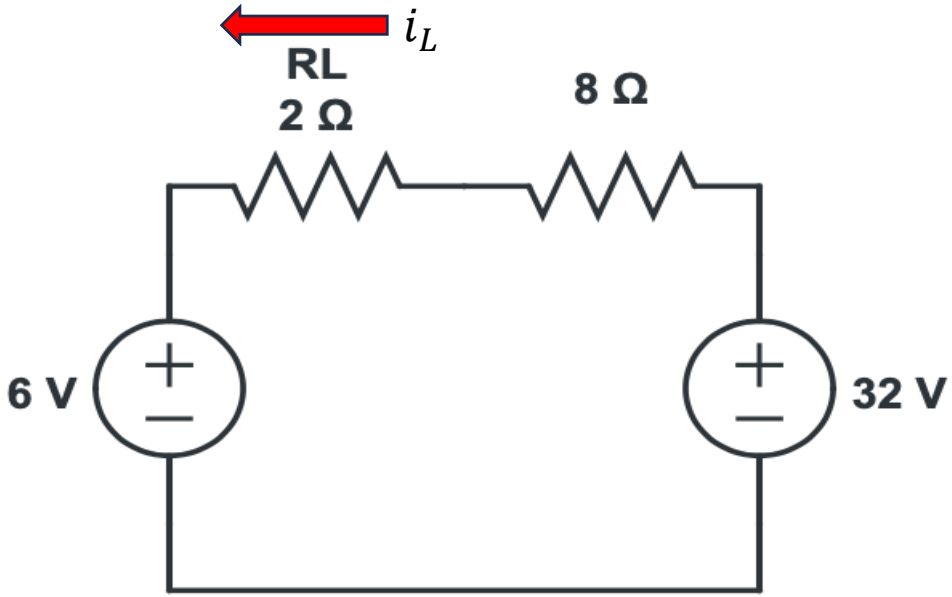
Find the current i_L when $R_L = 2\Omega$ using source transformation.



Source Transformations – Numerical Example 1

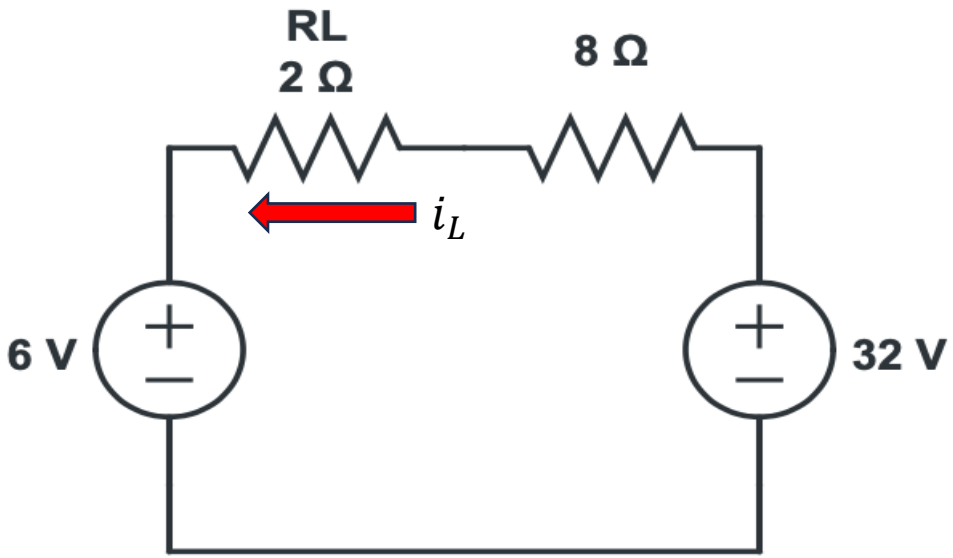
Solution:





Source Transformations – Numerical Example 1

Solution:



Apply KVL

$$32 - 8i_L - 2i_L - 6 = 0$$

$$10i_L = 26$$

$$i_L = 2.6\ A$$

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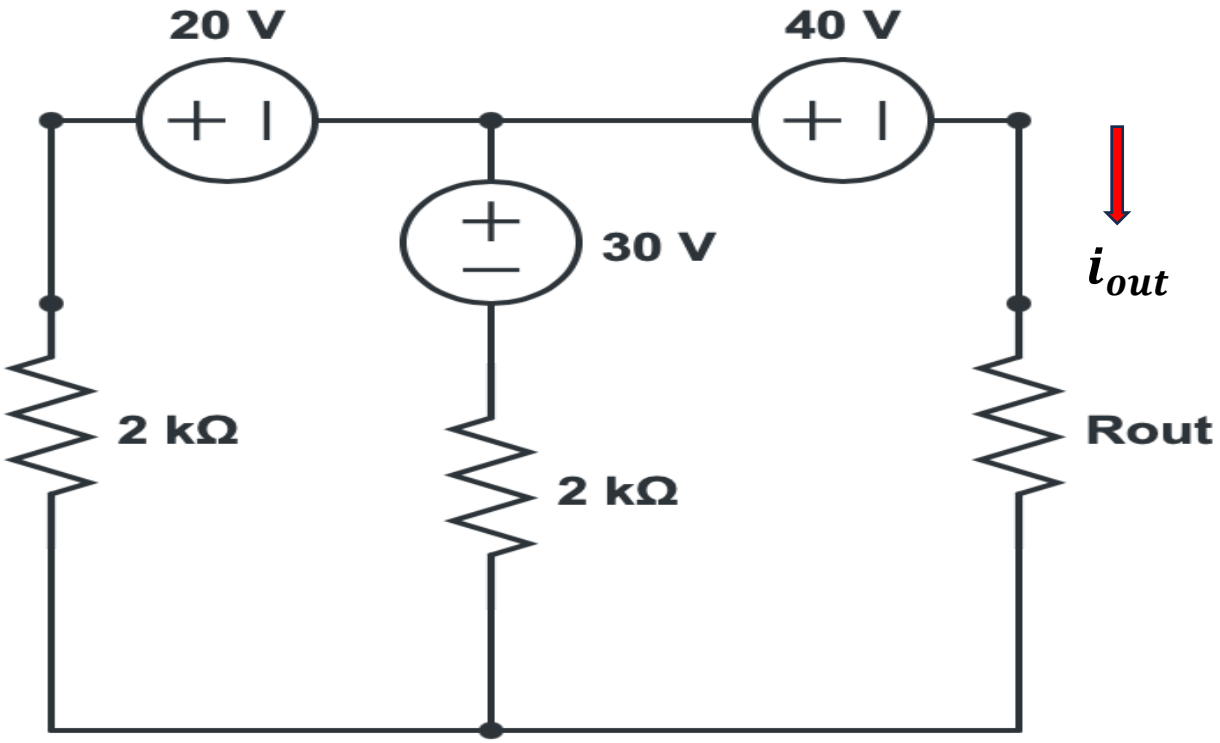
Source Transformations – Numerical Example 2

Question:

Find the current i_{out} when $R_{out} = 3\ k\Omega$ using source transformation.



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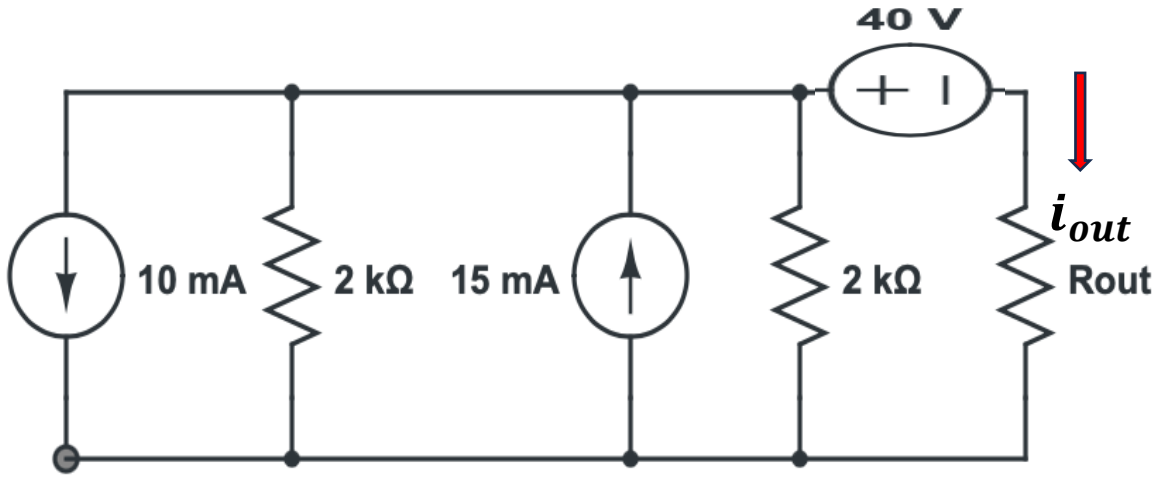
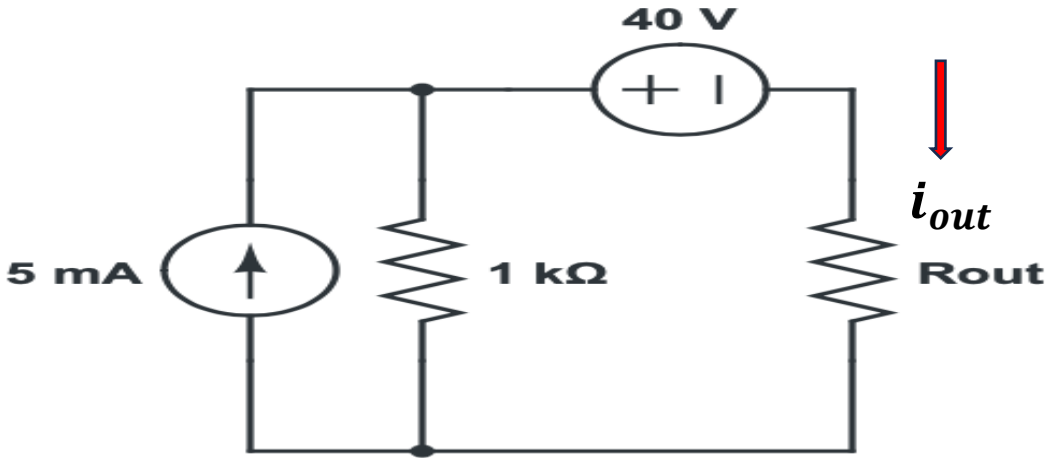
Source Transformations – Numerical Example 2

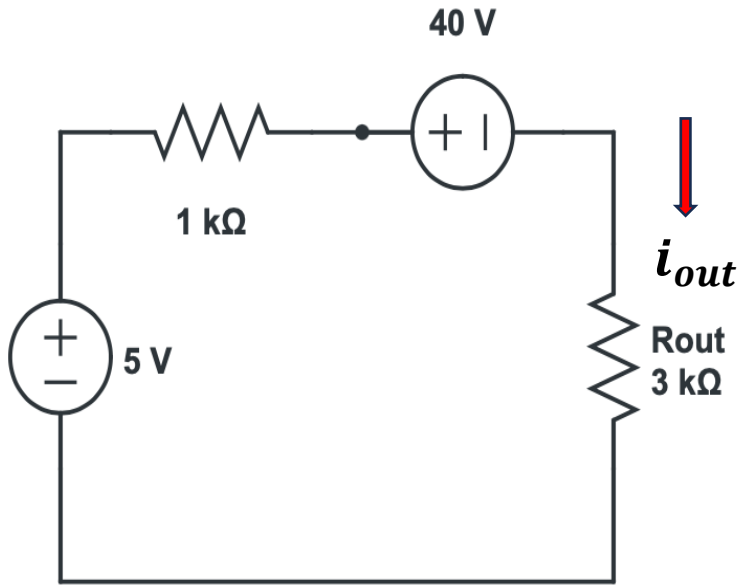
Solution:





Source Transformations – Numerical Example 2

Solution:



Apply KVL

$$5 - 1000 * i_{out} - 40 - 3000 * i_L = 0$$

$$4000 i_{out} = -35$$

$$i_{out} = -0.00875\ A\ or\ -8.75\ mA$$

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Text Book & References

Text Book:

1.“Basic Electrical Engineering”, D. C. Kulshreshta, 2nd Edition, McGraw-Hill. 2019

Reference Books:

1. “Engineering Circuit Analysis” William Hayt, Jack Kemmerly, Jamie Phillips and Steven Durbin, 10th Edition McGraw Hill, 2023

2. “Electrical and Electronic Technology” E. Hughes (Revised by J. Hiley, K. Brown & I.M Smith), 12th Edition, Pearson Education, 2016.

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THANK YOU

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