



NJATC BLENDED LEARNING Instructor Resources

AC Theory RL Series Circuit Practice—Student Worksheet

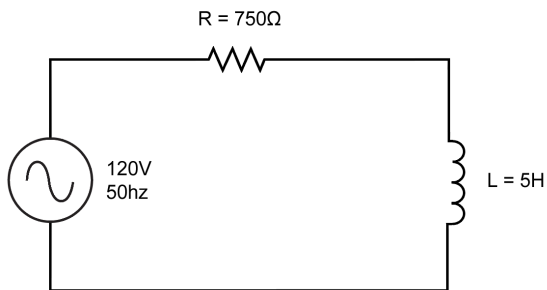
AC Theory RL Series Circuit Practice

This exercise will be extra practice for the students. It can be used as an impromptu quiz in class or send home as extra homework project, and will help cement the RL Series Circuit Formulas and concepts.

Each student will need a copy of the practice sheet, calculator, and formulas.

Set a time limit for the exercise. 20 minutes is a good starting time. Then check and see how they are doing and give extra time if needed. Only assign question #10 for students that need the challenge.

1.



$$I_T =$$

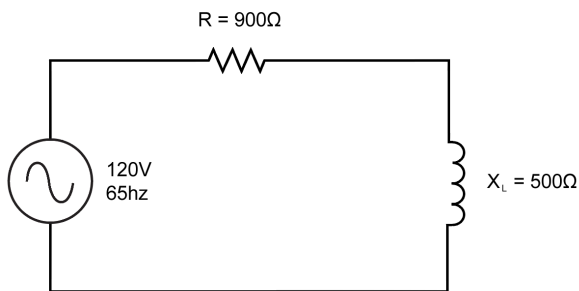
$$E_R =$$

$$X_L =$$

$$E_L =$$

$$Z =$$

2.



$$I_T =$$

$$E_R =$$

$$Z =$$

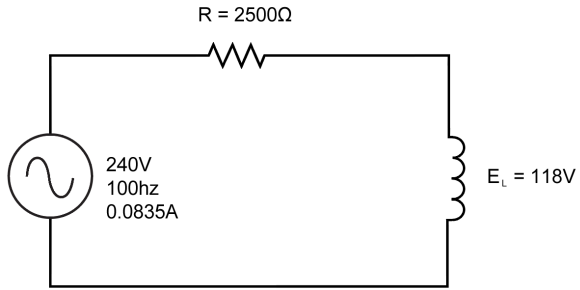
$$L =$$

$$E_L =$$

$$\%PF =$$

3.

$$E_R =$$



$$Z =$$

$$X_L =$$

$$L =$$

$$PF =$$

$$\%PF =$$

$$\theta =$$

4. Draw and label the impedance triangle for a series RL circuit.

5. Draw and label the voltage triangle for a series RL circuit.

6. Draw the impedance vector diagram for a series RL circuit.

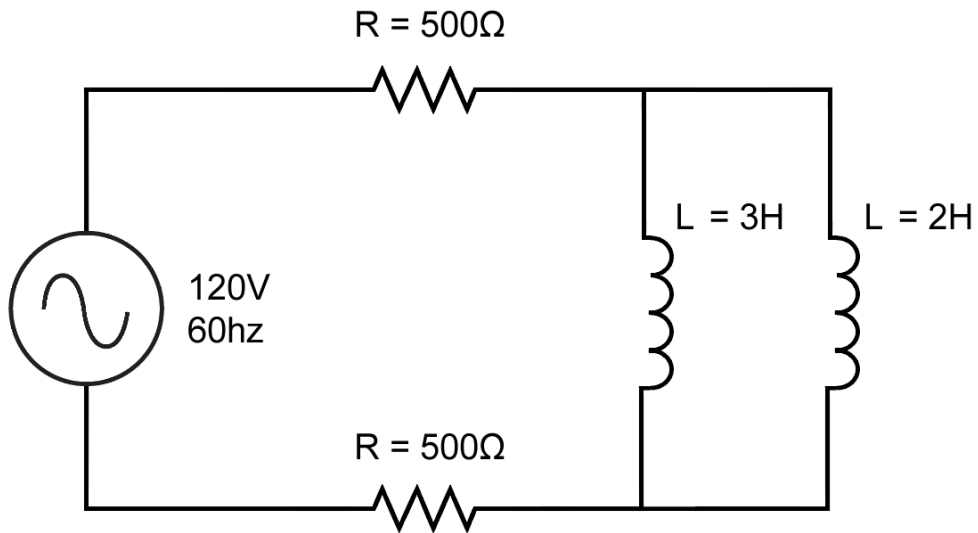
7. Draw the current vector diagram for series RL circuit.

8. Draw the voltage vector diagram for a series RL circuit.

9. If the frequency is increased in a series RL circuit, what happens to:

- a. X_L
- b. I_T
- c. Z
- d. PF
- e. θ

10. Extra Credit



- What is total resistance?
- What is total inductance?
- What is total Inductive reactance?
- What is Impedance?