

Student name: _____

The ideal approximation is sometimes called the

first approximation.

second approximation.

third approximation.

fourth approximation.

Which approximation is generally the best choice because it is easy to use and does not require a computer?

first

second

third

fourth

An ideal dc voltage source produces a load voltage

that is variable.

that is constant.

that is zero.

that is greater than 250 volts.

An ideal voltage source is a theoretical device because a real voltage source has

an infinite load resistance.

no internal resistance.

an internal resistance.

no load current.

The term stiff voltage source refers to a voltage source with a load resistance which is

- 5 times larger than the source resistance.
- 100 times larger than the source resistance.
- equal to the source resistance.
- 100 times smaller than the source resistance.

A dc current source produces a constant load current

- for different load resistances.
- for constant load resistances only.
- by using a constant voltage source.
- by using alternating current.

In the second approximation of a current source

- the internal resistance is in parallel with the ideal current source.
- the internal resistance is in series with the ideal current source.
- the internal resistance is zero.
- the internal resistance is infinity.

Thevenin's theorem is a statement that can be proven

- by troubleshooting.
- by experiment only.
- by using Ohm's Law.
- by using Kirchhoff's Laws.

The Thevenin voltage is sometimes called

- the open-circuit voltage.
- the short-circuit voltage.
- the source voltage.
- the load voltage.

What is a circuit often built with solderless connections without regard to the final location of parts?

- breadboard
- prototype
- circuit board
- batter board

In order to avoid loading error, a digital multimeter (DMM) is generally used to measure a voltage.

- true
- false

Norton current is sometimes called the open-circuit current.

- true
- false

Norton's theorem states that the load voltage equals the Norton current times the Norton resistance in parallel with the load resistance.

true

false

The duality principle states that for any theorem in electrical circuit analysis there is a dual (opposite) theorem in which one replaces the original quantities with dual quantities.

true

false

A Thevenin circuit cannot be converted to a Norton circuit.

true

false

Troubleshooting means finding out why a circuit is not doing what it is supposed to do.

true

false

The most common circuit troubles are

faulty power supplies.

improper design.

broken switches.

open and shorts.

A solder bridge

is a poor solder connection.

is also called a cold-solder joint.

effectively shorts any device between two conducting lines.

effectively opens any device between two conducting lines.

The current through an open device is

zero.

very high.

always greater than 10 amperes.

measured with a voltmeter.

The voltage across a shorted device is

zero.

very high.

always greater than 10 volts.

measured with an ammeter.

In a circuit, voltages are usually measured with respect to

the positive side of the power source.

the component known as the fuse.

ground.

the load.

In the troubleshooting procedure, after a component has been isolated as the top suspect,

replace it right away.

unsolder or disconnect it and use test equipment for confirmation.

replace component with a two-inch piece of number 16 gauge wire.

test component in the circuit using an ohmmeter.

The different levels of approximation are an ideal approximation, a second approximation, a third approximation, and an exact answer.

true

false

When troubleshooting, the ideal approximation is never adequate.

true

false

For higher approximations, a computer and a program like MultiSim should be used.

true

false

With an ideal voltage source, only the load current changes when the load resistance changes.

true

false

The second approximation of a dc voltage source includes internal resistance.

true

false

When can the source resistance be ignored?

when it is at least 100 times smaller than the load resistance

when it is at least 10 times smaller than the load resistance

when it is equal to the load resistance

never

A dc voltage source produces a constant load voltage

for different load resistances.

for equal load resistances only.

with zero load resistance.

by using alternating current.

When can the source resistance of a current source be ignored?

when it is at least 100 times larger than the load resistance

when it is at least 10 times larger than the load resistance

when it is equal to the load resistance

when it is zero

A current source that has a source resistance that is at least 100 times larger than the load resistance is called a

stiff current source.

staff current source.

potential current source.

kinetic current source.

Thevenin voltage is defined as the voltage across the load terminals when
the voltage source is removed.
the load resistor is open.
the load resistor is shorted.
the voltage source is shorted.

Thevenin resistance is defined as the resistance that an ohmmeter measures across the load
terminals when all sources are reduced to zero and
the load resistor is open.
the load resistor is shorted.
the load resistor is replaced with a transistor.
the load resistor is replaced with a fuse.

When you reduce a current source to zero
you are effectively replacing it by a short.
you are effectively replacing it by an open.
you are effectively replacing it by a low-value resistor.
you are effectively replacing it by a fuse.

A linear resistance
increases with increasing voltage.
decreases with increasing voltage.
does not change with increasing voltage.
is effectively nonlinear in a Thevenin circuit.

Thevenin theorem simplifies calculations and
enables us to explain circuit operation.
troubleshoots transistor circuits.
serves as a constant current source.
serves as a constant voltage source.

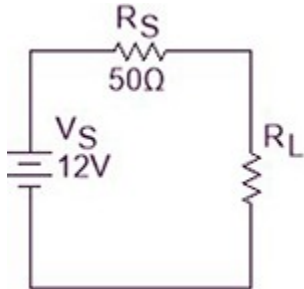
Whenever two vertical bars are used in an equation, it means
divide twice.
in series with.
in parallel with.
multiply the following value.

A breadboard is
a shelf used to store components.
a circuit often built with solderless connections.
a small printed circuit board.
a schematic diagram of a circuit.

The input impedance of a voltmeter should be how many times greater than the Thevenin resistance?

- 10
- 100
- 1000
- 2

Determine the minimum value for the load resistance, for this voltage source to be considered “stiff”, in the circuit shown below.



1 kΩ

5 kΩ

2 kΩ

3 kΩ

Determine the maximum value for the load resistance, for this current source to be considered “stiff”, in the circuit shown below.



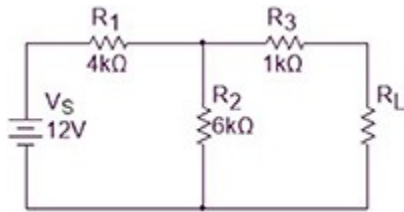
10 kΩ

50 kΩ

20 kΩ

30 kΩ

Determine the Thevenin resistance (R_{TH}), in the circuit shown below.



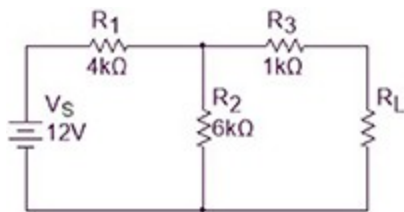
11 k Ω

5.6 k Ω

2.1 k Ω

3.4 k Ω

Determine the Thevenin voltage (V_{TH}), in the circuit shown below.



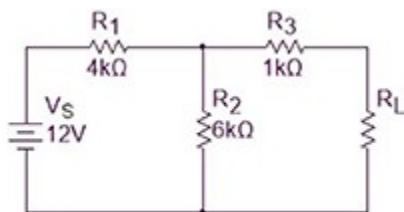
8.2 V

7.2 V

6.1 V

3.4 V

Determine the Norton resistance (R_N), in the circuit shown below.



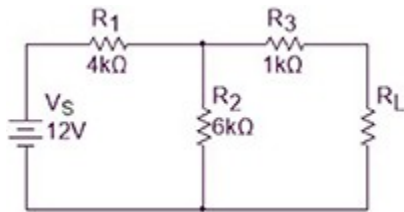
11 k Ω

5.6 k Ω

2.1 k Ω

3.4 k Ω

Determine the Norton current (I_N), in the circuit shown below.



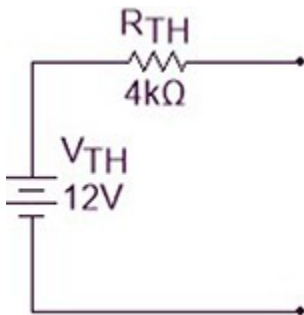
2.12 mA

7.21 mA

4.87 mA

3.42 mA

Determine the Norton current (I_N), using the Thevenin circuit shown below.



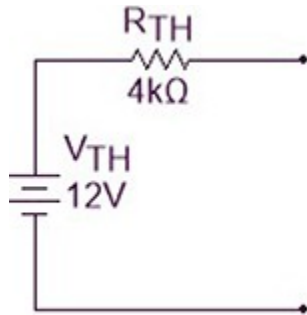
3 mA

4 mA

5 mA

6 mA

Determine the Norton resistance (R_N), using the Thevenin circuit shown below.



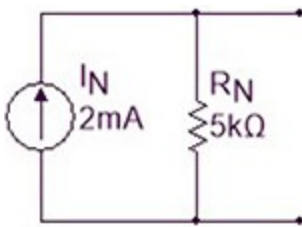
3 k Ω

4 k Ω

5 k Ω

6 k Ω

Determine the Thevenin voltage (V_{TH}), using the Norton circuit shown below.



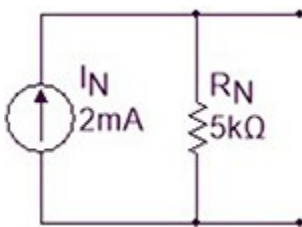
2.5 V

7.5 V

10 V

12 V

Determine the Thevenin resistance (R_{TH}), using the Norton circuit shown below.



3 k Ω

4 k Ω

5 k Ω

6 k Ω

Answer Key

Test name: CH1 Electronic Principles E9

A

B

B

C

B

A

A

C

A

A

TRUE

FALSE

TRUE

TRUE

FALSE

TRUE

D

C

A

A

C

B

TRUE

FALSE

TRUE

TRUE

TRUE

A

A

A

A

B

A

B

C

A

C

B

B

B

B

D

B

D

A

A

B

C

C