

**IB Physics**  
**FA 18.1 - Current, Voltage, Power**

Name\_\_\_\_\_

Best Reason to Miss School/Work\_\_\_\_\_

**Show your work, and make quiet chicken noises to receive full credit.**

1. How much current flows if you connect a 2.34 ohm resistor to a 12.0 volt battery?

2. If 0.129 amps of current flow through a 45 ohm resistor, what is the power dissipated?

3. If a current of 345 mA flows, how much charge will pass by in one (1.00) minute?

4. An 85 ohm heating element is connected to 120 volts. In what **time** can the heating element raise the temperature of 2.4 kg of water initially at 12 °C to 85 °C? (The specific heat of water is 4186 J/kg°C)

5. A 1200 Watt heater runs on alternating current with a peak voltage of 134 Volts. What is its **resistance**?



**IB Physics**  
**FA 18.2 - Resistivity and Electron Drift**

Name \_\_\_\_\_

Best Snow Day Activity \_\_\_\_\_

**Show your work, and bark like a yappy dog to receive full credit.**

1. What is the resistance of an Aluminium wire that is 2.59 mm in diameter (10 gauge) and 12.0 m long?

The resistivity of Aluminium is  $2.65 \times 10^{-8} \Omega\text{m}$ . (0.0604  $\Omega$ )

2. A 25.0 m long copper wire (resistivity =  $1.68 \times 10^{-8} \Omega\text{m}$ ) has a resistance of 0.127 ohms. What is its diameter? (2.05 mm)

3. A film resistor is made of a thin film of material that is  $1.01 \times 10^{-8}$  m thick, 3.50 cm wide, and 15.0 cm long. What is its resistivity if it has a resistance of 221 ohms? (The current flows a distance of 15.0 cm through the film) ( $52.1 \times 10^{-8} \Omega\text{m}$ )

4. With what speed do electrons travel down a 0.240 mm diameter copper wire that is carrying 140. mA of current. (n for Cu is  $8.50 \times 10^{28}$  electrons  $\text{m}^{-3}$ ) ( $2.27 \times 10^{-4}$  m/s)

5. A 85.0 cm long copper (resistivity =  $1.68 \times 10^{-8} \Omega\text{m}$ ,  $n = 8.50 \times 10^{28}$  electrons  $\text{m}^{-3}$ ) wire is 2.10 mm in diameter, and has a potential of 0.0150 V across it. What time does it take an electron to travel the length of the wire? (hint - find R, then I, then v, then t) ( $1.10 \times 10^4$  s or 3.06 hours)

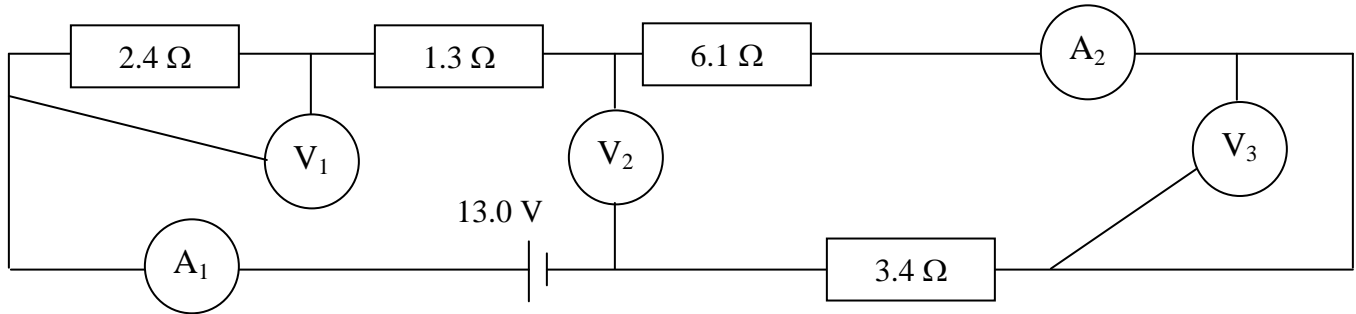


**IB Physics**  
**FA 19.1 - Series and Parallel**

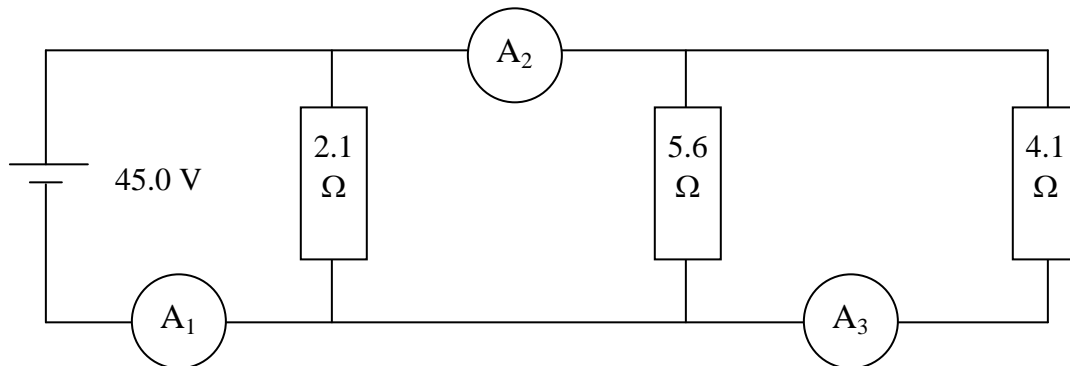
Name \_\_\_\_\_

Favorite TikTok \_\_\_\_\_ Favorite TikTok Fail \_\_\_\_\_

**Find the meter readings. Round your answers to three sig figs, and show your work.**



A <sub>1</sub>	A <sub>2</sub>	V <sub>1</sub>
V <sub>2</sub>	V <sub>3</sub>	Greatest power dissipated by a resistor:



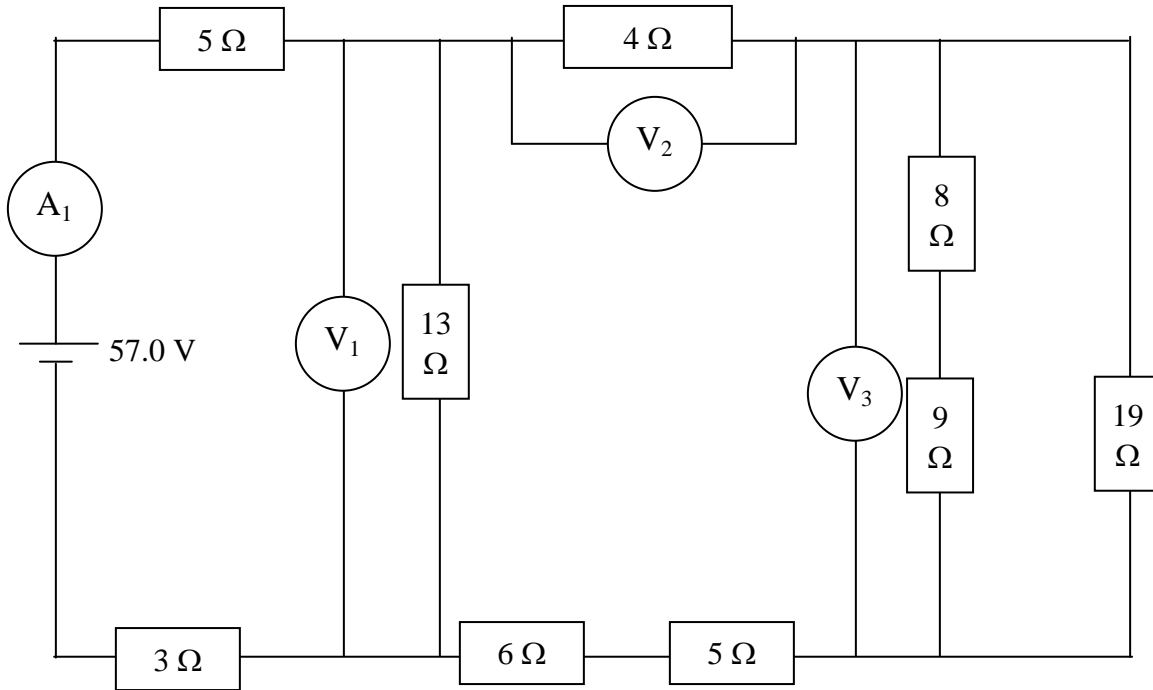
A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	Least power dissipated by a resistor
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Name \_\_\_\_\_

Favorite Snotty Retort to Parents \_\_\_\_\_

**Round your answers to three sig figs (retain five), and show your work.**



Find:

$A_1 =$  \_\_\_\_\_

$V_1 =$  \_\_\_\_\_

$V_2 =$  \_\_\_\_\_

$V_3 =$  \_\_\_\_\_

Find the current through:

$13 \Omega$  \_\_\_\_\_

$4 \Omega$  \_\_\_\_\_

$9 \Omega$  \_\_\_\_\_

$19 \Omega$  \_\_\_\_\_



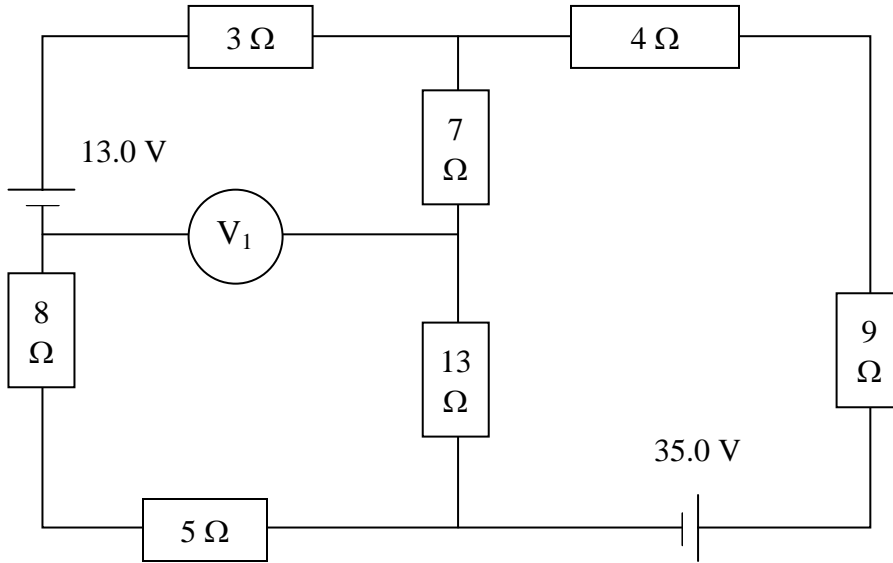


**IB Physics**  
**FA 19.3 - Kirchhoff's Laws**

Name \_\_\_\_\_

Favorite Punchline \_\_\_\_\_

**Round your answers to three sig figs (retain five), and show your work.**



Find the current and direction (up or down) through:

8 Ω \_\_\_\_\_

13 Ω \_\_\_\_\_

9 Ω \_\_\_\_\_

Find the voltage across:

4 Ω \_\_\_\_\_

5 Ω \_\_\_\_\_

Find power dissipated by:

3 Ω \_\_\_\_\_

7 Ω \_\_\_\_\_

Find:

$|V_1| =$  \_\_\_\_\_



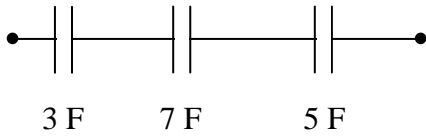
# IB Physics FA 19.4 - Capacitors in Parallel and Series

Name \_\_\_\_\_

Favorite Punchline \_\_\_\_\_

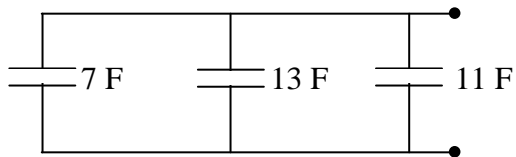
**Round your answers to three sig figs (retain five), and show your work.**

Find the capacitance:



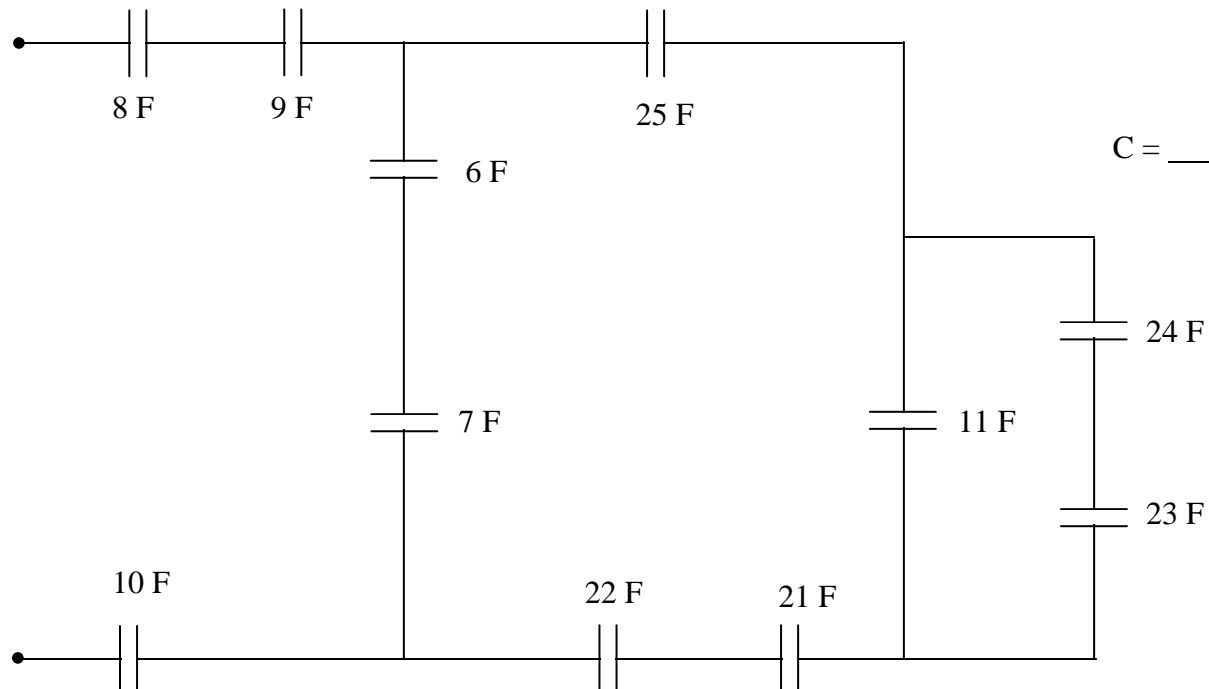
$C =$  \_\_\_\_\_ (1.48 F)

Find the capacitance



$C =$  \_\_\_\_\_ (31 F)

Find the freakin' capacitance:



$C =$  \_\_\_\_\_ (2.228 F)

