30 A fine mist of oil droplets is sprayed into air. As the oil droplets leave the nozzle of the spraying device they can become electrically charged.

What is **not** a possible value for the charge on an oil droplet?

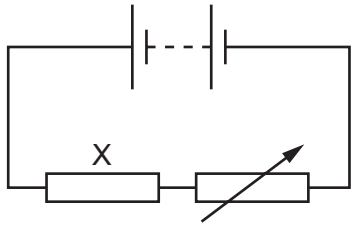
A zero

B 1.0×10^{-19} C

C 4.8×10^{-19} C

D 8.0×10^{-19} C

31 In the circuit shown, a fixed resistor X is connected in series with a battery and a variable resistor.



The power dissipated in resistor X is 7.2 W when a current of 3.0 A passes through it.

The variable resistor is adjusted so that the power dissipated in X increases by 50%.

What is the new current in the circuit?

A 2.4 A **B** 3.7 A **C** 4.5 A **D** 14 A

32 The potential difference across a metal wire is kept constant. The length l and the diameter d of the wire are both varied. The type of metal is kept the same.

How is the current in the wire related to l and d?

A It is directly proportional to l and inversely proportional to d.

B It is directly proportional to l and inversely proportional to d^2.

C It is inversely proportional to l and directly proportional to d.

D It is inversely proportional to l and directly proportional to d^2.