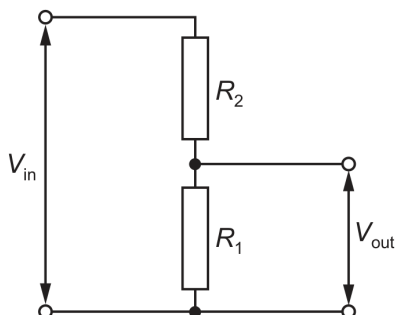# Unit 10: D.C. circuits:

Subunit 10.3: Potential dividers:

Topical Question No: 1

37 A potential divider consists of two resistors of resistances R_1 and R_2 connected in series across a source of potential difference (p.d.) V_{in}. The p.d. across R_1 is V_{out}.
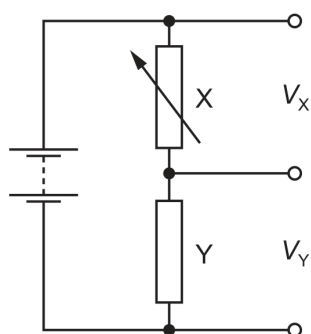

Which changes to R_1 and to R_2 will increase the value of V_{out}?

	R_1	R_2
A	doubled	doubled
B	doubled	halved
C	halved	doubled
D	halved	halved

Topical Question No: 2

36 A potential divider circuit is constructed with one variable resistor X and one fixed resistor Y, as shown.


The potential difference across resistor X is V_X and the potential difference of resistor Y is V_Y.

As the resistance of X is increased, what happens to V_X and to V_Y?

	V_X	V_Y
A	falls	rises
B	falls	stays the same
C	rises	falls
D	rises	stays the same

38 The circuit shown consists of two resistors of resistances 10 kΩ and 50 kΩ and a component Y.

A 6.0 V supply is provided. The electric potential of the bottom wire is 0 V.
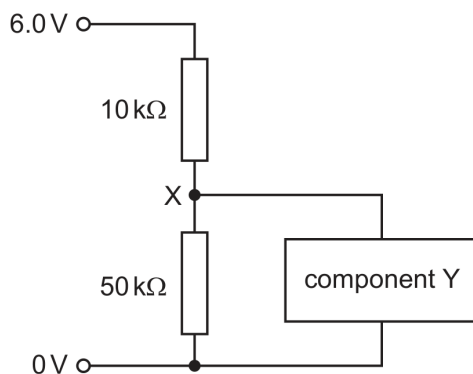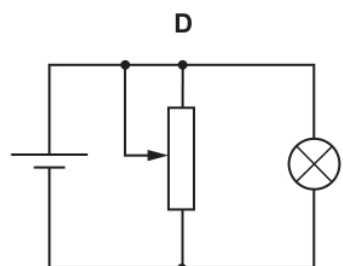

The current in component Y is negligible.

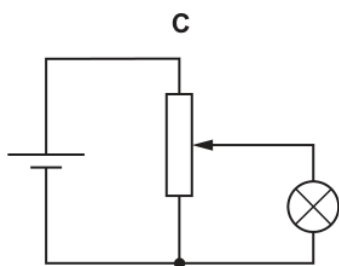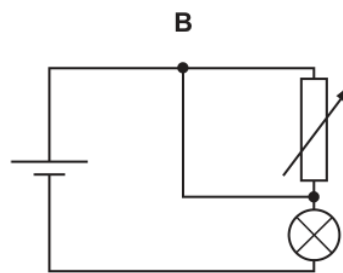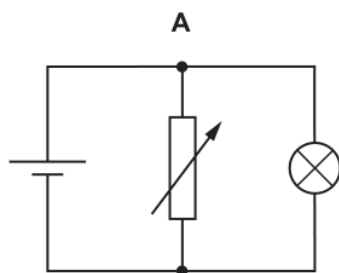What is the electric potential at junction X?

A 1.0 V **B** 1.2 V **C** 4.8 V **D** 5.0 V

37 In the circuits shown, the cell has negligible internal resistance.

Which diagram shows a potential divider circuit that can vary the potential difference (p.d.) across the lamp?

37 In the circuit shown, XY is a length L of uniform resistance wire. R_1 and R_2 are unknown resistors. J is a sliding contact that joins the junction of R_1 and R_2 to points on XY through a small signal lamp S.
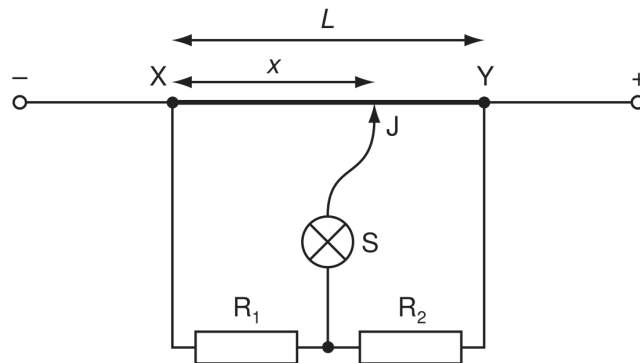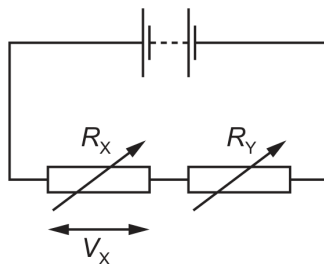

To determine the ratio $\dfrac{V_1}{V_2}$ of the potential differences across R_1 and R_2, a point is found on XY at which the lamp is off. This point is at a distance x from X.

What is the value of the ratio $\dfrac{V_1}{V_2}$?

A $\dfrac{L}{x}$ **B** $\dfrac{x}{L}$ **C** $\dfrac{L-x}{x}$ **D** $\dfrac{x}{L-x}$

36 A potential divider circuit is formed by connecting a battery of negligible internal resistance in series with two variable resistors, as shown.

The variable resistors have resistances R_X and R_Y.
V_X is the potential difference across resistance R_X.

R_X and R_Y are both changed at the same time.

Which combination of changes **must** cause V_X to increase?

	R_X	R_Y
A	larger	larger
B	larger	smaller
C	smaller	larger
D	smaller	smaller

35 A potential divider consists of resistors of resistance R_1 and R_2 connected in series across a source of potential difference V_0. The potential difference across R_1 is V_{out}.
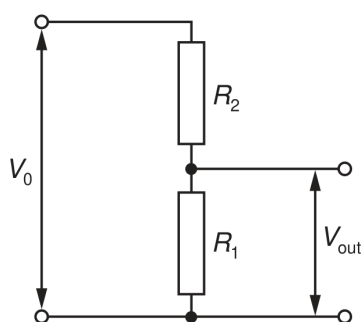
Which changes to R_1 and R_2 will increase the value of V_{out}?

	R_1	R_2
A	doubled	doubled
B	doubled	halved
C	halved	doubled
D	halved	halved

Answer Key

1. N/A

2. N/A

3. N/A

4. C

5. N/A

6. N/A

7. N/A