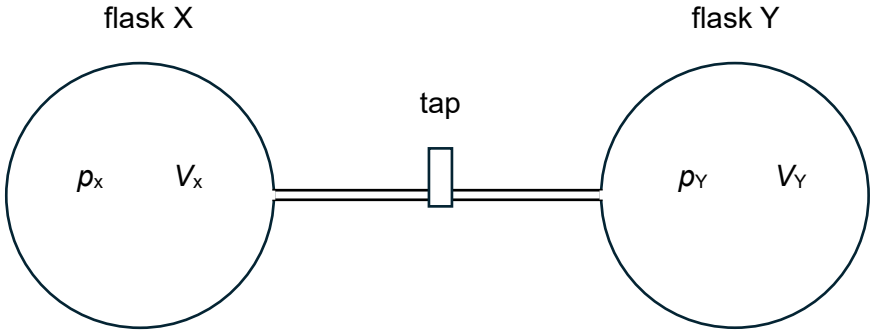
11

Some ideal gas is contained in two flasks X and Y. The flasks are connected by a tube of negligible volume that is fitted with a tap, as shown.



With the tap closed, the pressure and volume of the gas in the flask X are p_x and V_x respectively. In flask Y, the gas has pressure p_Y and volume V_Y. The temperature of the gas in both flasks is T.

The tap is opened. After some time, the temperature of the gas returns to T at pressure P and volume V.

Which expression relates the pressures and the volumes before and after opening the tap once the temperature has returned to T?

A

$$pV = (p_x - p_y) \times (V_x - V_y)$$

B

$$pV = \frac{1}{2}(p_x + p_y) \times \frac{1}{2}(V_x + V_y)$$

C

$$pV = p_x V_x + p_y V_y$$

D

$$pV = (p_x + p_y) \times (V_x + V_y)$$