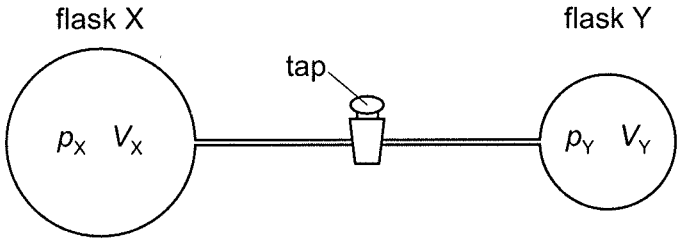
17 Some ideal gas is contained in two flasks X and Y. The flasks are connected by a tube of negligible volume that is fitted with a tap, as shown.



With the tap closed, the pressure and volume of the gas in 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 $pV = (p_X + p_Y) \times (V_X + V_Y)$