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Kathuri Abhinav

⇒ Given $PV^n = C$

Applying ln on both sides

$$\ln(PV^n) = \ln(c)$$

$$\ln(P) + n\ln(V) = \ln(c)$$

$$\ln P + \left(-n\ln\left(\frac{1}{v}\right)\right) = \ln C$$

$$\ln(P) - n\ln\left(\frac{1}{v}\right) = \ln c$$

$$\ln(P) = \ln(c) + n\ln\left(\frac{1}{v}\right)$$

$$Y = w_0 + w_1(x)$$

where, $Y = \ln(P)$; $x = \ln\left(\frac{1}{v}\right)$

$$A = \sum_{i=1}^{m} x_i = \sum \ln(1/v) = -26.929$$

$$B = \sum_{i=1}^{m} Y_i = \sum \ln(P) = 20.254$$

$$C = \sum_{i=1}^{m} x_i^2 = \sum \ln(1/v)^2 = 121.975$$

$$D = \sum_{i=1}^{m} x_i Y_i = \sum \ln(1/v) \times \ln(P) = -89.349$$

$$W_0 = \frac{BC-AD}{mC-A^2}$$ $\Rightarrow W_0 = \ln(C)$

$e^{W_0} = C$

$W_0 = 9.675$

$\boxed{\therefore C = e^{9.675} = 15,914.72}$

$$W_1 = \frac{AB-mD}{A^2-mC}$$ $\therefore W_1 = n$

$W_1 = 1.403$

$\boxed{\therefore n = 1.403}$

(b) Given equation $PV^n = C \rightarrow (1)$

from the above question

$n = 1.40$ and $C = 15914.72$

Substituting values of n, C in (1)

$P . V^{(1.40)} = 15914.72.$

(c) Value of P when V is 100

Substituting $V = 100$, in the above equation.

$P(100)^{1.4} = 15914.72$

$P = 25.223.$