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The density of argon at a pressure of  $1.00 \times 10^5$  Pa and at a temperature of 300 K is  $1.60 \text{ kg m}^{-3}$ .

What is the root-mean-square speed of argon molecules at this temperature?

**A**

$216 \text{ m s}^{-1}$

**B**

$250 \text{ m s}^{-1}$

**C**

$306 \text{ m s}^{-1}$

**D**

$433 \text{ m s}^{-1}$