

- 13** Air is enclosed in a cylinder by a gas-tight, frictionless piston of cross-sectional area $3.0 \times 10^{-3} \text{ m}^2$. When atmospheric pressure is 100 kPa, the piston settles 80 mm from the end of the cylinder (see diagram 1).

The piston is then pulled out until it is 160 mm from the end of the cylinder (see diagram 2) and is held there. The temperature of the air in the cylinder returns to its original value.

diagram 1

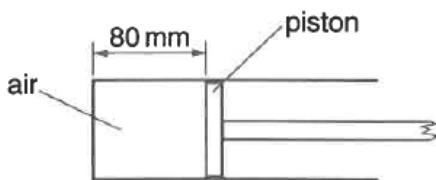
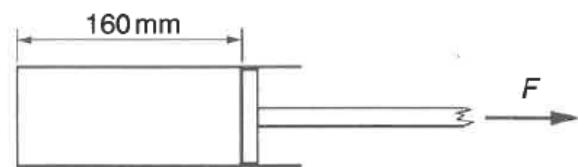


diagram 2



What is the force F required to hold the piston in its new position?

A 150 N

B 200 N

C 300 N

D 600 N