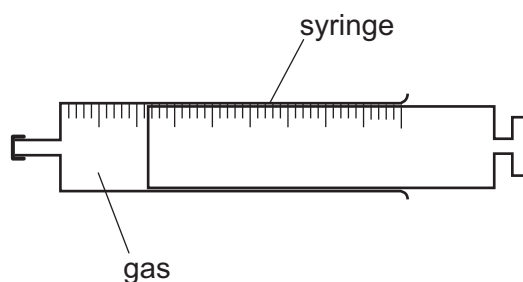


- 16 A gas is contained inside a syringe, as shown.



The initial volume of the gas is 2.00 cm^3 .

Atmospheric pressure is 101 kPa .

What is the work done by the gas on the atmosphere when the gas is heated and expands to a volume of 6.00 cm^3 ?

- A** $404 \mu\text{J}$ **B** 404 mJ **C** 404 J **D** 404 kJ
- 17 A mechanical device does useful work at rate X and wastes energy at rate Y .

Which expression gives the efficiency of this device?

- A** $\frac{X}{Y}$ **B** $\frac{(X - Y)}{Y}$ **C** $\frac{X}{(X + Y)}$ **D** $\frac{(X - Y)}{(X + Y)}$

- 18 Car P has kinetic energy 240 kJ .

Car Q has half the mass and twice the speed of car P.

What is the kinetic energy of car Q?

- A** 120 kJ **B** 240 kJ **C** 480 kJ **D** 960 kJ

- 19 A water pump is driven by an engine. The pump raises a volume of 0.50 m^3 of water in 1.0 minute from a depth of 30 m . The pump has an efficiency of 70% .

The density of water is 1000 kg m^{-3} .

What is the useful output power from the engine?

- A** 2.5 kW **B** 3.5 kW **C** 150 kW **D** 210 kW