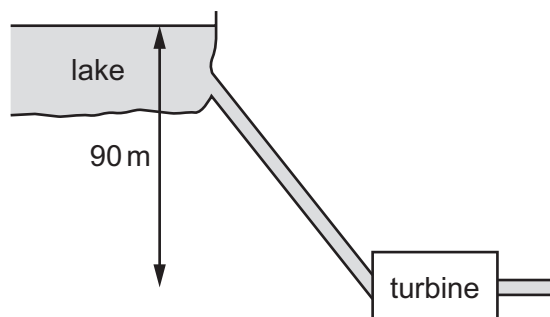


- 19 Water flows from a lake into a turbine that is a vertical distance of 90 m below the lake, as shown.



The mass flow rate of the water is  $2400 \text{ kg min}^{-1}$ . The turbine has an efficiency of 75%.

What is the output power of the turbine?

- A 26 kW      B 35 kW      C 1.6 MW      D 2.1 MW
- 20 A wire of diameter  $d$  and length  $l$  hangs vertically from a fixed point. The wire is extended by hanging a mass  $M$  on its end. The Young modulus of the wire is  $E$ . The acceleration of free fall is  $g$ .

Which equation is used to determine the extension  $x$  of the wire?

- A  $x = \frac{Ml}{\pi d^2 E}$       B  $x = \frac{Mgl}{\pi d^2 E}$       C  $x = \frac{4Mgl}{\pi d E}$       D  $x = \frac{4Mgl}{\pi d^2 E}$