

- 13** Liquids X and Y are stored in large open tanks. Liquid X has a density of 800 kg m^{-3} and liquid Y has a density of 1200 kg m^{-3} .

At which depths are the pressures equal?

	depth in liquid X / m	depth in liquid Y / m
A	8	20
B	10	15
C	15	10
D	20	8

- 14** A train of mass $3.3 \times 10^6 \text{ kg}$ is moving at a constant speed up a slope inclined at an angle of 0.64° to the horizontal. The engine of the train is producing a useful output power of 14 MW.

Assume that there are no frictional forces opposing the motion of the train.

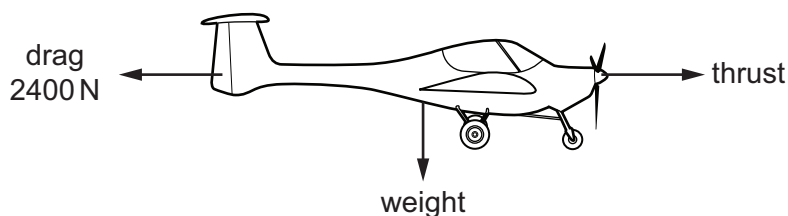
What is the speed of the train?

- A** 0.43 ms^{-1} **B** 4.2 ms^{-1} **C** 39 ms^{-1} **D** 380 ms^{-1}
- 15** A cannon-ball of mass 3.50 kg is fired at a speed of 22.0 ms^{-1} from a gun on a ship at a height of 6.00 m above sea level.

The total energy of the cannon-ball is the sum of the gravitational potential energy relative to the surface of the sea and the kinetic energy.

What is the total energy of the cannon-ball as it leaves the gun?

- A** 206 J **B** 641 J **C** 847 J **D** 1050 J
- 16** An aircraft travels at a constant velocity of 90 ms^{-1} in horizontal flight. The diagram shows some of the forces acting on the aircraft.



The mass of the aircraft is 2000 kg.

What is the power produced by the thrust force?

- A** $1.8 \times 10^5 \text{ W}$ **B** $2.2 \times 10^5 \text{ W}$ **C** $1.8 \times 10^6 \text{ W}$ **D** $2.0 \times 10^6 \text{ W}$