

- 1 A student creates a table to show reasonable estimates of some physical quantities.

Which row is **not** a reasonable estimate?

	quantity	value
A	current in a fan heater	12 A
B	mass of an adult person	70 kg
C	speed of an Olympic sprint runner	10 m s ⁻¹
D	water pressure at the bottom of a garden pond	10 ⁶ Pa

- 2 A particle travels in a straight line with speed v .

The particle slows down and changes direction. The new speed of the particle is $\frac{v}{2}$.

The new velocity has a component of $\frac{v}{4}$ in the same direction as the initial path of the particle.

Through which angle has the particle turned?

- A** 27° **B** 30° **C** 45° **D** 60°

- 3 The speed v of a liquid leaving a tube depends on the change in pressure ΔP and the density ρ of the liquid. The speed is given by the equation

$$v = k \left(\frac{\Delta P}{\rho} \right)^n$$

where k is a constant that has no units.

What is the value of n ?

- A** $\frac{1}{2}$ **B** 1 **C** $\frac{3}{2}$ **D** 2

- 4 The values of displacement, velocity and acceleration of a vehicle can be deduced from graphs representing its motion. Often the areas under these graphs, or the gradients of the graphs, are used.

What would **not** give a value for a displacement, a velocity or an acceleration?

- A** area under a velocity-time graph
B gradient of a displacement-time graph
C gradient of a velocity-time graph
D gradient of an acceleration-time graph