

- 17 A motor is used to lift a load vertically upwards.

The load has weight W .

The motor produces useful power output P .

The load is lifted at constant velocity v .

Which expression gives the time taken for the motor to lift the load vertically upwards through a distance d ?

- A $\frac{P}{Wd}$ B $\frac{Wv}{P}$ C $\frac{Wd}{P}$ D $\frac{Pv}{W}$

- 18 A lamp is switched on for 2.0 hours. The power input to the lamp is 1.0 W. The energy given out by the lamp as light is 7.0×10^3 J.

How much energy is converted to other forms by the lamp?

- A 120 J B 200 J C 3400 J D 7200 J

- 19 An object of mass m is dropped onto the surface of two planets, X and Y, which have no atmosphere.

The height from which the object is dropped and the change in gravitational potential energy of the object, for each planet, are given in the table.

	height / m	change in gravitational potential energy
planet X	3	ΔE
planet Y	4	$4\Delta E$

The acceleration of free fall near the surface of planet X is g_x .

What is the acceleration of free fall near the surface of planet Y?

- A $\frac{3}{4}g_x$ B $\frac{4}{3}g_x$ C $3g_x$ D $4g_x$

- 20 A known tensile force acts on a metal wire. The wire does not exceed its limit of proportionality.

Which two measurements enable the strain of the wire to be calculated?

- A the unstretched length of the wire and the cross-sectional area of the wire
B the unstretched length of the wire and the extension of the wire
C the Young modulus of the metal and the extension of the wire
D the Young modulus of the metal and the unstretched length of the wire