

Question 1

The statements describe what happens when the power of a machine is increased.

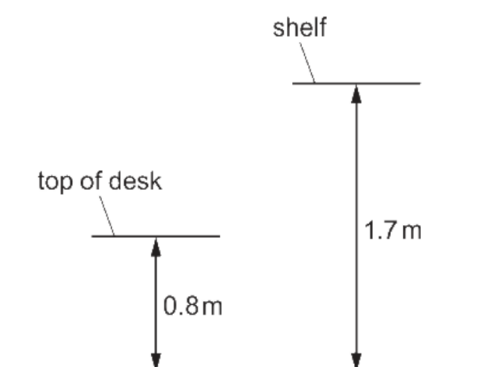
- 1 The work done in a given time decreases.
- 2 The work done in a given time increases.
- 3 The time taken to do a given quantity of work decreases.
- 4 The time taken to do a given quantity of work increases.

Which statements are correct?

- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

Question 2

A boy takes 0.60s to lift a book of mass 0.60kg from the top of a desk and place it on a shelf. The top of the desk is 0.80m above the floor, and the shelf is 1.7m above the floor. The gravitational field strength is 10N/kg.

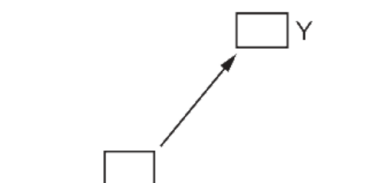


Which power does the boy develop?

- A** 0.9W **B** 1.7W **C** 9.0W **D** 17W

Question 3

A mass is lifted from rest on the ground to Y. There is no air resistance.



P is the increase in gravitational energy of the mass.

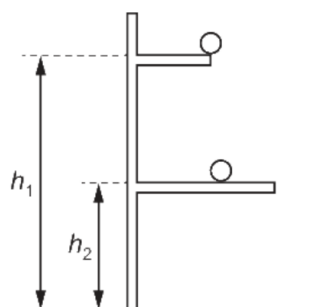
Q is the kinetic energy of the mass at Y.

Which expression is equal to the mechanical work done on the mass?

- A** $P + Q$ **B** $P - Q$ **C** $Q - P$ **D** $P \times Q$

Question 4

An object of mass m falls from a higher shelf to a lower shelf.



How much gravitational potential energy does the object lose?

- A** mgh_2 **B** $\left(\frac{m}{g}\right)h_2$ **C** $\left(\frac{m}{g}\right)(h_1 - h_2)$ **D** $mg(h_1 - h_2)$

Question 5

A pump does 460 000 J of work to raise water to fill a tank. It takes 7 minutes to fill the tank.

What is the power of the pump?

- A** 1.1 kW **B** 66 kW **C** 3200 kW **D** 190 000 kW

Question 6

An electric car is charged overnight. In 8.0 hours, 180 MJ of energy is transferred.

What is the power of the charger?

- A** 6.3 kW **B** 380 kW **C** 23 MW **D** 1400 MW

Question 7

The mass of air hitting the blades of a wind turbine each second is 1.5×10^4 kg.

The speed of the air is 4.0 m/s.

The density of air is 1.2 kg/m^3 .



Which row gives the volume of the air hitting the blades each second and the kinetic energy of the air hitting the blades each second?

	volume of air each second/ m^3	kinetic energy each second/J
A	13000	72000
B	13000	120000
C	18000	72000
D	18000	120000

Question 8

A boy uses a rope to pull an object of mass m up a slope.

The rope is parallel to the slope.

The tension in the rope is constant and of value F .

The object moves a distance d along the slope and rises through a height h .

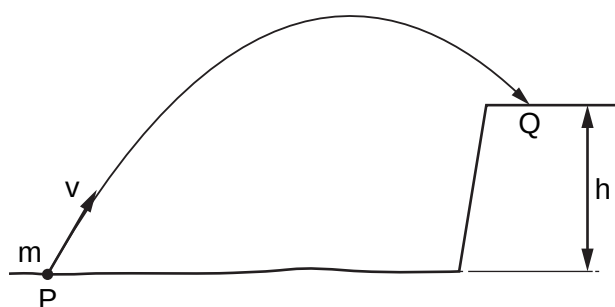
How much work is done by the boy?

- A $F \times d$
- B $F \times h$
- C $m \times g \times h \times d$
- D $m \times g \times h^2$

Question 9

The diagram shows an object of mass m being projected with speed v from a point P to a point Q on top of a cliff height h .

The object does work W against air resistance as it travels from P to Q.



What is the kinetic energy of the object when it reaches point Q?

- A $\frac{1}{2} mv^2 + mgh + W$
- B $\frac{1}{2} mv^2 + mgh - W$
- C $\frac{1}{2} mv^2 - mgh + W$
- D $\frac{1}{2} mv^2 - mgh - W$

Question 10

An object has a mass of 20 kg.

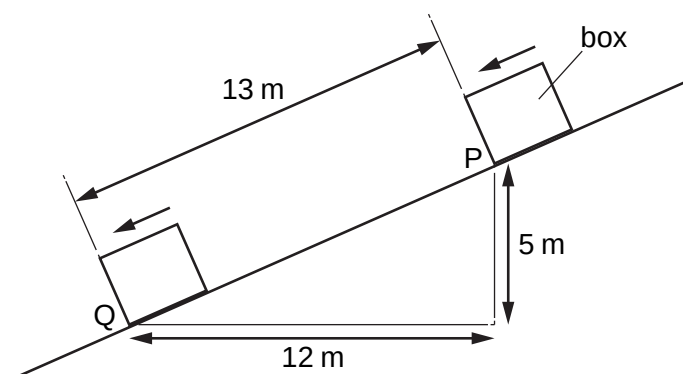
It is taken up stairs through a height of 4.0 m.

What is the increase in the store of gravitational potential energy?

- A** 5.0J **B** 49J **C** 80J **D** 780J

Question 11

A box of mass 2.0 kg slides down a slope. The gravitational field strength is 9.8 N / kg.



What is the decrease in the gravitational potential energy stored as the box moves from P to Q?

- A** 9.8 J **B** 98 J **C** 240 J **D** 250 J