

Question 1

A crane takes 2.0 minutes to lift a 500kg load to the top of a building that is 12m high.

What is the useful power developed against gravity by the crane?

- A** 21W **B** 50W **C** 500W **D** 30000W

Question 2

A crane is used to lift loads vertically.

The output power of the crane to lift a car is P.

The crane then lifts a lorry, which has 3.0 times the weight of the car, through 0.25 of the distance in 0.50 of the time.

What is the output power of the crane now?

- A** $\frac{3P}{8}$ **B** $\frac{3P}{2}$ **C** $\frac{8P}{3}$ **D** 6P

Question 3

What is the unit of power?

- A** joule
B newton
C volt
D watt

Question 4

An engine produces 240kJ of energy in 2.0 minutes.

What is the power output of the engine?

- A** 2.0kW **B** 120kW **C** 480kW **D** 28800kW

Question 5

A boy holds onto a bar and pulls himself up until his chin is level with the bar.

He raises himself through 40cm in 0.5s.

The weight of the boy is 500N.

What is the average power he produces as he raises himself?

- A** 40 W **B** 400 W **C** 4000 W **D** 40 000 W

Question 6

A child runs up a set of stairs four times. The time taken for each run is recorded.

Which time is measured when the child's useful power is greatest?

- A** 10s **B** 20s **C** 30s **D** 40s

Question 7

Which two physical quantities must be used to calculate the power developed by a student running up a flight of steps?

- A** force exerted and the vertical height of the steps only
B force exerted and the time taken only
C work done and the vertical height of the steps only
D work done and the time taken only

Question 8

To calculate the power produced by a force, the size of the force must be known.

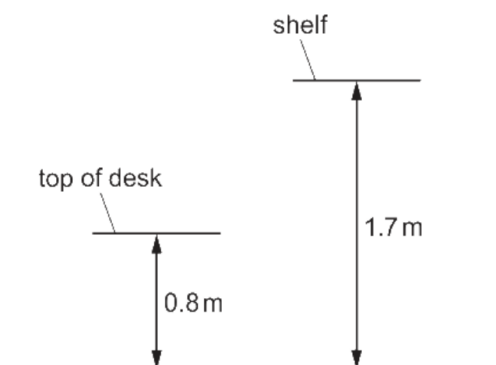
What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	x
C	x	✓
D	x	x

key
 ✓ = needed
 x = not needed

Question 9

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



Which power does the boy develop?

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

Question 10

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 11

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