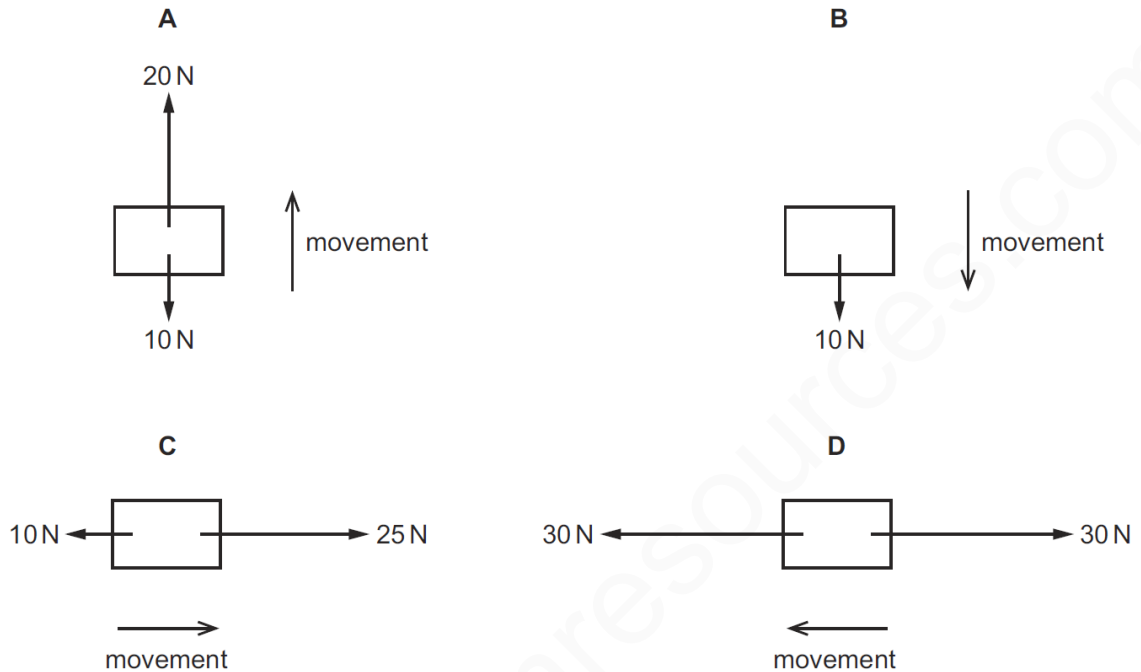# WORK-ENERGY-POWER-NUMERICALS-SET-1

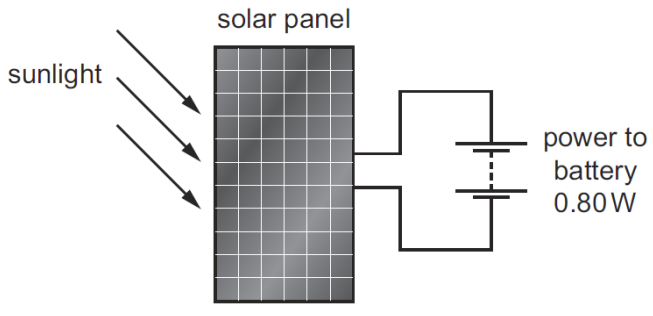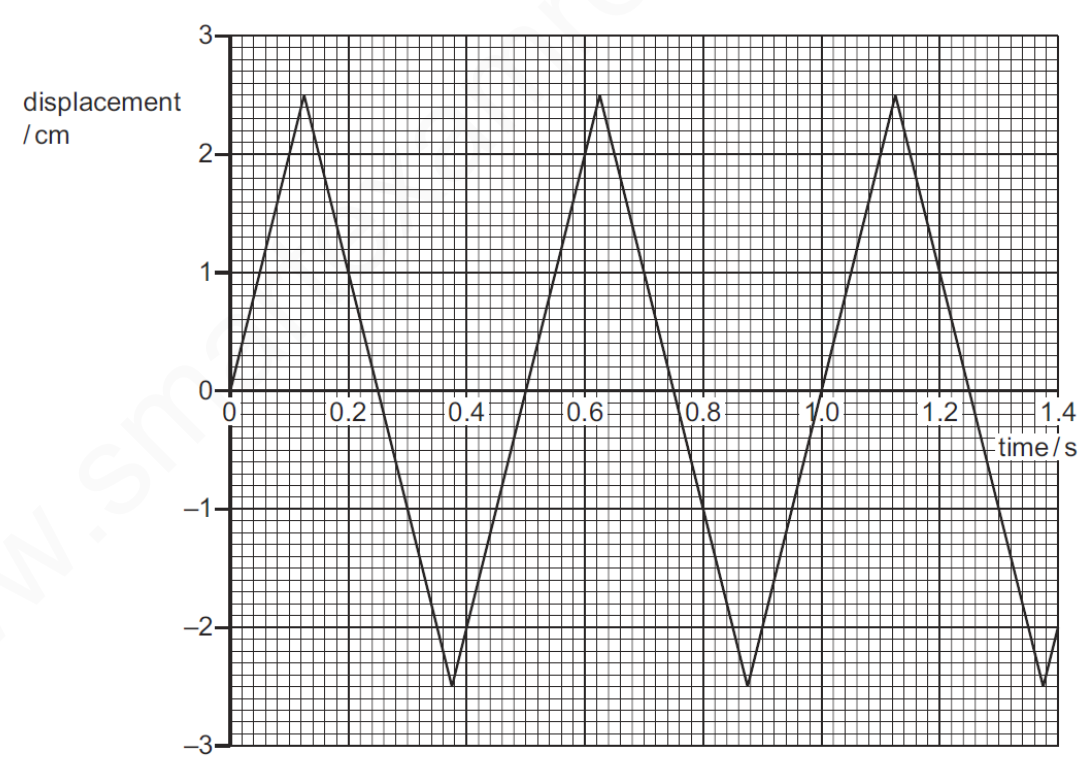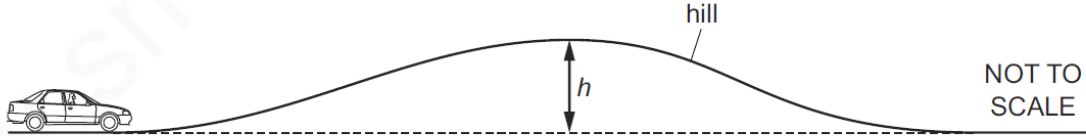| 1	The diagrams show four bodies moving in the directions shown. The only forces acting on the bodies are shown in each diagram. Which body gains the most kinetic energy when moving a distance of 1.0 m?
MS-1	C
2	A steel ball is fired vertically upwards with a velocity v. The ball reaches a height h. The same ball is now fired vertically upwards from the same position with a velocity $2v$. Air resistance can be ignored. What is the new height reached by the ball? **A** h **B** $2h$ **C** $4h$ **D** $8h$
MS-2	C

3	A solar panel is used to recharge a battery. The solar panel produces 0.80 W of electrical power. The panel is 20% efficient.
	What is the power input of the sunlight onto the solar panel?
	A 0.16 W **B** 4.0 W **C** 8.0 W **D** 16 W
MS-3	B
4	A ball of mass 1.2 kg is dropped from a height of 30 m. As it falls, 25% of its initial gravitational potential energy is transferred to thermal energy. What is the kinetic energy of the ball just before it hits the ground? **A** 27 J **B** 90 J **C** 270 J **D** 360 J
MS-4	C
5	A girl hangs by her hands from a bar in the gymnasium. She pulls herself up until her chin is level with the bar. The mass of the girl is 48 kg. She pulls herself up through a distance of 0.25 m. She does this in 2.0 s. What is the useful power she uses to pull herself up? **A** 6.0 W **B** 24 W **C** 60 W **D** 240 W
MS-5	C

6	A crane on a construction site lifts concrete beams. The useful work done by the crane is 4000 kJ in a time of 160 s. What is the useful output power of the crane? **A** 0.04 kW **B** 25 W **C** 25 kW **D** 640 kW
MS-6	C
7	An aircraft with a mass of 300 000 kg is flying at an altitude of 2000 m with a speed of 100 m/s. What is the kinetic energy of the aircraft? **A** 1.5×10^4 kJ **B** 1.5×10^6 kJ **C** 3.0×10^6 kJ **D** 6.0×10^6 kJ
MS-7	B
8	The vertical displacement of a mass of 0.20 kg changes with time. The graph shows how this displacement changes. At which rate does it gain gravitational potential energy as it moves upwards? **A** 0.025 W **B** 0.050 W **C** 0.20 W **D** 0.40 W
MS-8	D

9	The table shows the times taken for four children to run up a set of stairs. Which child's power is greatest?

	mass of child / kg	time / s
A	40	10
B	40	20
C	60	10
D	60	20

MS-9	C

10	Which movement will require the greatest amount of work to be done?
	A a force of 10 N moving an object a distance of 3.0 m
	B a force of 10 N moving an object a distance of 5.0 m
	C a force of 15 N moving an object a distance of 3.0 m
	D a force of 15 N moving an object a distance of 5.0 m

MS-10	D

11	A car of mass 800 kg travels over a hill of height h.

hill

NOT TO SCALE

h

By travelling to the top of the hill, the car gains 40 000 J of gravitational potential energy.

The gravitational field strength g is 10 N/kg.

What is the height h of the hill?

A   5.0 m   **B**   20 m   **C**   50 m   **D**   500 m

MS-11	A