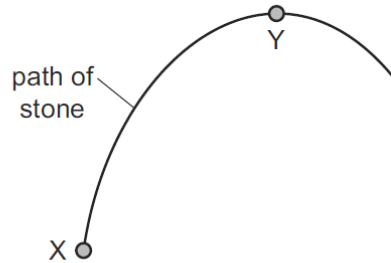


WORK-ENERGY-POWER NUMERICALS-SET-2

1

The diagram shows the path of a stone that is thrown from X and reaches its maximum height at Y.



The stone gains 10 J of gravitational potential energy as it moves from X to Y.

The stone has 2.0 J of kinetic energy at Y.

Air resistance can be ignored.

How much kinetic energy did the stone have immediately after it was thrown at X?

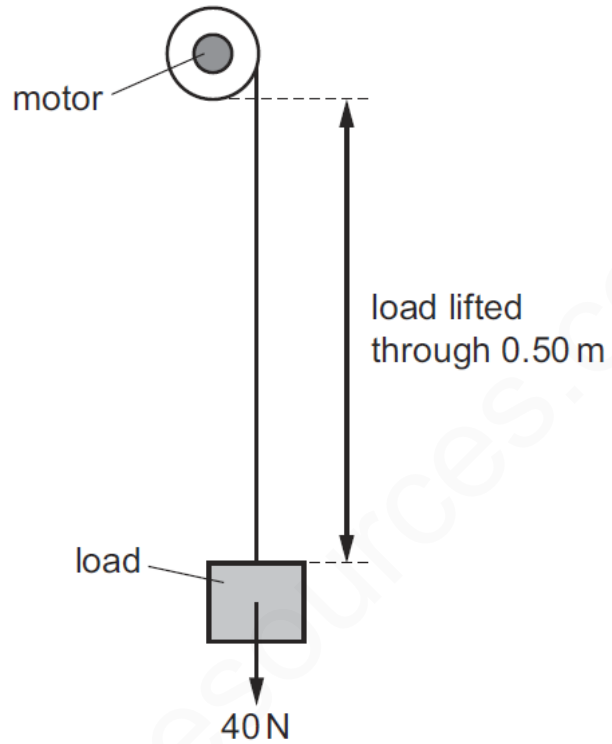
- A** 2.0 J **B** 8.0 J **C** 10 J **D** 12 J

MS-1

D

2

A motor is used to lift a load of 40 N.



The power of the motor is 40 W and the system is 20% efficient.

How long does it take the motor to lift the load through 0.50 m?

A 0.50 s

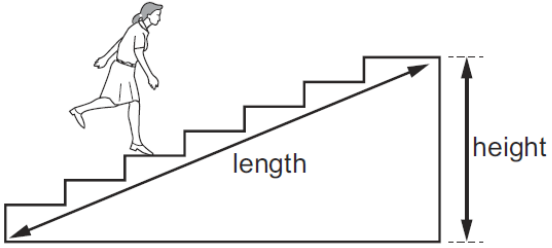
B 2.5 s

C 5.0 s

D 25 s

MS-2


B

3	<p>A student runs up a flight of stairs.</p>  <p>Which information is not needed to calculate the rate at which the student is doing work against gravity?</p> <p>A the height of the flight of stairs B the length of the flight of stairs C the time taken to run up the stairs D the weight of the student</p>
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MS-3	12
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4	<p>An object has a mass of 500 kg. It moves with a speed of 30 m/s. What is its kinetic energy?</p> <p>A 7.5 kJ B 15 kJ C 225 kJ D 450 kJ</p>
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MS-4	C
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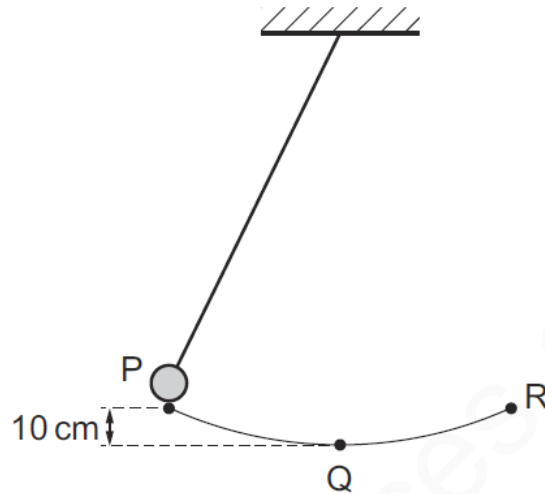
5	<p>A car, starting from rest at position X, accelerates up a hill. The car reaches a speed of 10 m/s at position Y.</p> <p>The kinetic energy of the car at position Y is equal to its gain in gravitational potential energy from X to Y.</p>  <p>Take the gravitational field strength g to be 10 N/kg.</p> <p>What is the gain in height of the car between X and Y?</p> <p>A 0.50 m B 5.0 m C 10 m D 50 m</p>
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MS-5	B
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6	<p>An object, initially at rest, is dropped from a height of 12.0 m. The change in gravitational potential energy when it falls to the ground is 565 J.</p> <p>The frictional forces are negligible.</p> <p>What is its speed when it hits the ground?</p> <p>A 4.71 m/s B 15.5 m/s C 47.1 m/s D 240 m/s</p>
MS-6	B
7	<p>A man climbs a ladder.</p> <p>Which two quantities can be used to calculate the useful power of the man?</p> <p>A the weight of the man and the time taken only</p> <p>B the weight of the man and the vertical distance moved only</p> <p>C the work done by the man and the time taken only</p> <p>D the work done by the man and the vertical distance moved only</p>
MS-7	C

8

The diagram shows a pendulum.



The pendulum swings from P to Q to R and back to P.

P is 10 cm higher than Q.

At which speed does the pendulum bob pass through Q?

- A** 0.44 m/s **B** 1.0 m/s **C** 1.4 m/s **D** 2.0 m/s

MS-8

C

9

A man carries 20 tiles from the ground to the roof of a house. Each tile has a mass of 1.2 kg. The roof of the house is 15 m above the ground.

How much work does the man do against gravity on the tiles in carrying them to the roof?

- A** 36 J **B** 180 J **C** 360 J **D** 3600 J

MS-9

D

10

A car is moving along a straight horizontal road. The car has 1.6 MJ of kinetic energy. The car accelerates for 20 s until the kinetic energy of the car increases to 2.5 MJ.

What is the minimum average power developed by the car engine for this acceleration?

- A** 45 W **B** 205 W **C** 45 kW **D** 205 kW

MS-10

C