

Answers to Semester 1 Final Practice Math Problems

A ball falls freely from rest for 12.0 s. Calculate the ball's velocity at 8.0 s.

78.4 m/s

A stone is thrown horizontally at 20.0 m/s from the top of a cliff 45 m high. How far from the base of the cliff does the stone hit the ground?

60.6 m

Calculate the speed of a swimmer who swims 100 m in 80 s.

1.25 m/s

Convert 1.2 hours to minutes.

72 minutes

How much work does the force of gravity do when a 10.0-N object falls a distance of 40.0 m?

400 joules

Small rockets are used to make tiny adjustments in the speed of satellites. One such rocket has a thrust of 60.0 N. If it is fired to change the velocity of an 80,000-kg spacecraft by 25 cm/s, how long should it be fired? Note: 25 cm need to be converted into meters and the average acceleration is $(V_f - V_i)/t$.

333.3 Seconds = 6 minutes if rounding to the nearest minute.

The temperature drops from 25 to 15 Celsius in 10 hours. Find the average temperature change per hour.

1 degree Celsius per hour

What is the weight of a 40 kg space probe on the moon? The acceleration of gravity on the Moon is 1.62 m/second squared?

64.8 N

You lift a 3.61-kg textbook from the floor to a shelf 2.79 m above the floor. What is the book's gravitational potential energy relative to the floor?

98.7 joules