Crack the Code | Vertical Motion Under Gravity

In all questions, use the acceleration due to gravity as $9.8\,ms^{-1}$ and assume that the object can be modelled as a particle.

A	A stone is dropped from the top of a cliff. The stone takes 4 seconds to reach the sea at the bottom of the cliff. Find the height of the cliff. 78.4 m	**B**	A ball is dropped from a height of 44.1 metres above the ground. Find the time taken for the ball to reach the ground. 3 s
C	An apple is projected vertically downward with a velocity of $12\ \text{ms}^{-1}$. The apple travels 11 metres before hitting the ground. Find the velocity of the apple as it hits the ground. 19.0 m/s	**D**	A tennis ball is thrown vertically upward from the ground with a velocity of $15\ \text{ms}^{-1}$. Find the maximum height above ground that the ball reaches. 11.5 m
E	A pebble is projected vertically upwards. It reaches its maximum height 2.5 seconds later. Find the initial velocity of the pebble. 24.5 m	**F**	A particle is projected vertically upwards with a velocity of $u\ \text{ms}^{-1}$. Three seconds later the particle is moving downwards with a velocity of $16\ \text{ms}^{-1}$. Find the value of u. 13.4 m/s
G	A stone is projected upwards from a height of 7.2 metres. It reaches the ground 8 seconds later. Find the initial velocity of the stone. 38.3 m/s	**H**	A ball is projected upwards from a height of 1.5 m above the ground with an initial velocity of $18\ \text{ms}^{-1}$. Find the time taken for the ball to hit the ground. 1.9 s
I	A ball is projected vertically upwards from a height 3 m above the ground, with a velocity of $20\ \text{ms}^{-1}$. It reaches the ground 6 seconds later. Find the total distance travelled by the ball. 43.8 m	**J**	Particle A is dropped from a height $2h$ m. At the same time, particle B is projected upwards from height h with a velocity of $10\,ms^{-1}$. They both hit the ground at the same time. Find height h. 40.8 m

Round all answers to 1 decimal place. To get the three-digit code, add all your answers together then round to the nearest integer.