🧪 **2018 Ph H1 Q2**
Section: Our Dynamic Universe
Topic: Motion, Equations and Graphs

Question Summary

A ball is dropped from rest and bounces several times.
The velocity–time graph shows:

- **P**: the ball hitting the ground
- **Q–R** and **R–S**: motion between bounces

Which statements are correct?
I. The ball hits the ground at P.
II. The ball is moving upwards between Q and R.
III. The ball is moving upwards between R and S.

✅ Final Answer:

D. I and II only

Working

- **Statement I**: Correct — velocity changes sign at **P**, which means the ball hits the ground and reverses direction.
- **Statement II**: Correct — between **Q and R**, velocity is **positive** (above the zero line), so the ball is moving **upwards**.
- **Statement III**: Wrong — between **R and S**, velocity is **negative**, so the ball is moving **downwards**.

Quick Tips

- **Above the time axis** = upward motion; **below** = downward motion.
- The point where velocity crosses **zero** marks the ball reaching its highest point.
- Velocity–time graphs can show direction (sign), not just speed.
