

| Question Number | Scheme | Marks |
|-----------------------------|--|-----------------------------|
| 5(a) | $0 = 14.7^2 - 2gs$ | M1A1 |
| | 22 or 22.1 (m) | A1 |
| | | (3) |
| 5(b) | $19.6 = 29.4t + \frac{1}{2}gt^2$ N.B. $19.6 = 29.4t - \frac{1}{2}gt^2$ is M0A0 $-19.6 = 29.4t + \frac{1}{2}gt^2$ is M0A0 $-19.6 = 29.4t - \frac{1}{2}gt^2$ is M0A0 unless they go on to subtract 6 from the positive root | M1A1 |
| | $t = 0.61$ or 0.606 (s) | A1 |
| | | (3) |
| 5(c) | <p>The graph shows a velocity-time relationship. The vertical axis is labeled v and has tick marks for 0 and 29.4. The horizontal axis is labeled t. A straight line starts at the point (0, 29.4) and ends at the point (3, 0). The line is downward-sloping between these two points, forming a V-shape that is symmetric about the vertical axis.</p> | B1 shape B1 29.4 B1 3 |
| | | (3) |
| | | (9) |
| Notes for question 5 | | |
| 5(a) | M1 Complete method to find distance UP N.B. They may find time UP (1.5s) AND use it to find distance UP OR: (Distance from A to top – Distance from ‘14.7’ to top) $= (44.1 - 33.075)$ | |
| | A1 Correct equation(s) used | |
| | A1 cao | |
| 5(b) | M1 Complete method to find required time N.B. They may find the speed as it hits the ground ($g\sqrt{13} = 35.334\dots$) AND use it to find the time. | |
| | A1 Correct equation(s) used | |
| | A1 cao | |
| | N.B. If they add to or subtract from 0.606, it's M0 for an incorrect method. | |
| 5(c) | B1 V shape with v coord of end pt > 29.4 and each half roughly equally inclined to the t -axis. B0 if a vertical line is included at the end. | |
| | B1 29.4 independent | |
| | B1 3 independent | |