| Question | Scheme | Marks | AOs | |
|---|---|-------|------|--|
| 3(a)(i) | Equation of motion for <i>P</i> with usual rules | M1 | 3.3 | |
| (ii) | $T - 1.5 = 0.4 \times 2.5$ | A1 | 1.1b | |
| | T = 2.5 (N) | A1 | 1.1b | |
| | Equation of motion for Q with usual rules | M1 | 3.3 | |
| | 10M - T = 2.5M | A1 | 1.1b | |
| | M = 0.33 | A1 | 1.1b | |
| | | (6) | | |
| (b) | $2 = \frac{1}{2} \times 2.5t^2$ | M1 | 3.4 | |
| | t = 1.3 (s) | A1 | 1.1b | |
| | | (2) | | |
| (c) | e.g. the mass of the rope | B1 | 3.5b | |
| | | (1) | | |
| (9 marks) | | | | |
| Notes: | | | | |
| (a) (i) M1: Resolve horizontally for <i>P</i> A1: Correct equation A1: Correct answer. Ignore units (a)(ii) | | | | |
| M1: Resolve vertically for Q | | | | |
| A1: Coi A1: Coi | A1: Correct equation A1: Correct answer | | | |
| (b) | 1 | | | |
| M1: Use $s = ut + \frac{1}{2}at^2$ | | | | |
| A1: 1.3. Ignore units | | | | |
| (c) B1: e.g. | e.g. the pulley may not be smooth, air resistance | | | |