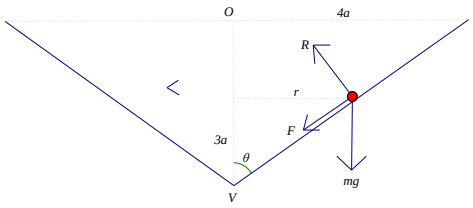
| | | | |
|---|---|---|---|
| 4 |  | | If angle is between incline and vertical then $\sin\theta = \frac{4}{5}, \cos\theta = \frac{3}{5}$ |
| | Resolve vertically | M1 | Need all terms. Dimensionally correct. Condone sign errors and sin/cos confusion. |
| | $R\sin\theta = mg + F\cos\theta$ | A1<br><br>A1 | Unsimplified equation with at most one error.<br>Correct unsimplified equation |
| | Equation for horizontal motion | M1 | Need all terms. Dimensionally correct. Condone sign errors and sin/cos confusion. Accept any form of acceleration for the method mark only. |
| | $R\cos\theta + F\sin\theta = mr\omega^2$ | A1<br><br><br><br>A1 | Unsimplified equation with at most one error. Direction of $F$ consistent with vertical resolution. Incorrect form of acceleration is one error.<br><br>Correct unsimplified equation |
| | Use of $F = \mu R$ | M1 | Used, not just quoted.<br>$F = \frac{1}{4}R$ |
| | Substitute for trig and solve for max $\omega$ | DM1 | Dependent on all preceding M marks. If more than two equations are produced, the correct two must be used.<br>$\left(R = \frac{20mg}{13}, F = \frac{5mg}{13}\right)$ |
| | $\Rightarrow \omega = \sqrt{\frac{16g}{13r}}$ | A1* | Obtain given answer from correct working<br>. |
| | | **[9]** | |
| | | **(9)** | |
| Alt1 | Using N2L parallel and perpendicular to the incline.<br><br>Perpendicular<br>$R - mg\sin\theta = mr\omega^2\cos\theta$<br><br>Parallel<br>$F + mg\cos\theta = mr\omega^2\sin\theta$ | <br><br><br>M1<br>A1A1<br><br>M1<br>A1A1 | Need all terms. Dimensionally correct. Condone sign errors and sin/cos confusion. Note that the acceleration must have a sin/cos component. Accept any form of acceleration for the method mark only. Mark A's as above.<br><br>A1A0 Unsimplified equation with at most one error<br>A1A1 Correct unsimplified equation |