

Source: <https://www.pololu.com/file/download/fa_130ra.pdf?file_id=0J11>

Possible Gearbox ratios: 203:1 or 58:1 (<https://core-electronics.com.au/tamiya-70097-twin-motor-gearbox-kit.html>)

Angular Velocity Calculation:

Linear Velocity Calculation:

Calculation of time taken to cover test area:

Torque Calculations:

Summary Table:

|  |  |  |
| --- | --- | --- |
| Criteria | 58:1 Gear Ratio | 203:1 Gear ratio |
| Speed | 0.32 | 0.089 |
| Torque) | 34 | 120 |
| Time (mins) | 0:52 | 3:04 |

Although the 203:1 gear ratio provides substantially more torque for overcoming rough terrain or inclines, it may not complete the course in the allocated 5 minutes, accounting for stops and re-runs. Hence, the 58:1 gear ratio will be chosen as it provides the required speed.