**Answer on Question 48838, Physics, Mechanics — Kinematics — Dynamics** On Jupiter a day lasts for 9.9 earth hours and the circumference at the equator is 448600 km. If the measured value of gravitational acceleration at the equator is 24.6 ms ,-2 what is the true gravitational acceleration and the centrifugal acceleration.
Solution
Angular velocity is

$$\nu = \frac{2\pi}{9.9 \cdot 3600} \approx 0.000028 \cdot 2\pi \, s^{-1}$$

Hence, centrifugal acceleration is

$$a = \nu^2 r = 0.000176 \cdot \frac{448600 \cdot 10^3}{2\pi} \approx 0.353 m/s^2$$

True gravitational acceleration then is

$$g = 24.6 - 0.353 \approx 24.2 m/s^2$$