

Supervision 6

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Read the following sections of the handouts:

Section 13 Rotational Kinetic Energy - Section 19 Gyroscope Examples

Section 20 Absolute position and the geocentric universe - Section 34 Simultaneity

Problem Sheet – Q7 - Q13

Hints for Q10:

Draw a diagram to show the following vectors: the torque on the wheel by the string, all the forces on the wheel, the direction of the precession, and the direction of the wheel's rotation around the axle. Don't forget the right-hand rule when calculating $\underline{G} = I \underline{\Omega} \times \underline{\omega}$.

Hints for the last question of Q13:

Calculate x and t for the following two events in the rest frame of the Earth:

- a) When the spaceship passes the Earth, they calibrate their clocks at 12:00.*
- b) When the reply signal from the Earth catches the spaceship.*

Then use the Lorentz transformation to find the x' and t' of these two events in the rest frame of the spaceship.