

Homework 07

Prerequisites: Read chapter 9.

Problem 1 (3 points):

Show that

$$\vec{A} \cdot (\vec{B} \times \vec{C}) = \det(\vec{A}, \vec{B}, \vec{C}) = \det \begin{pmatrix} A_x & A_y & A_z \\ B_x & B_y & B_z \\ C_x & C_y & C_z \end{pmatrix} \quad (1)$$

Problem 2 (3 points):

Using above show that

$$\vec{A} \cdot (\vec{B} \times \vec{C}) = -\vec{C} \cdot (\vec{B} \times \vec{A}) \quad (2)$$

Problem 3 (3 points):

Show that

$$\frac{\partial(\vec{r}^2)}{\partial \vec{r}} = 2\vec{r} \quad (3)$$

Do it via components x, y, z expansion

Problem 4 (3 points):

Look at the equation 9.34 in the Taylor's book. Compare it to the $m\vec{a}$ expression for a non-inertial frame which derived in the class. Which two terms are missing in the book. Why? What are the assumptions?