

MONDAY 29TH SEPTEMBER : CROSS PRODUCT

Reading: sections 9.4 and 9.5
Homework: see www.courses.fas.harvard.edu/~math21a/

1. CROSS PRODUCTS AND TORQUE

(1) Let

$$\mathbf{a} = 2\mathbf{i} - \mathbf{k} \quad \mathbf{b} = \mathbf{j} + \mathbf{k}$$

Compute

(a) $\mathbf{a} \times \mathbf{b}$

(b) $\mathbf{b} \times \mathbf{a}$

(2)

2. CROSS PRODUCTS, AREAS AND VOLUMES

- (1) Find the area of the triangle with vertices P , Q and R , where

$$P = (1, 0, 0) \quad Q = (0, 1, 0) \quad R = (0, 0, 1)$$

Find a vector perpendicular to the plane containing P , Q and R .

- (2) Find the volume of the parallelepiped defined by the vectors

$$\mathbf{a} = \langle 3, 0, -1 \rangle \quad \mathbf{b} = \langle 1, 1, 0 \rangle \quad \mathbf{c} = \langle 4, 1, 1 \rangle$$