

## Home Work 2

1. Find the angle between the two vectors

$$V_1 = (1 \quad 3 \quad 5 \quad 9)$$

$$V_2 = (2 \quad 7 \quad 6 \quad 6)$$

2. Calculate

$$\text{proj}_{V_1} V_2 \quad \text{and} \quad \text{proj}_{V_2} V_1$$

3. Write down the cartesian and the vector equation of the line  $l$  joining  $V_1$  &  $V_2$  in problem 1.
4. Calculate the direction cosines of  $V_1$  along all the four co-ordinates.

5. Verify

$$|v_1 \cdot v_2| \leq \|v_1\| \|v_2\|$$

using explicit calculation.

6. Let  $v_1, v_2$  be as in problem 1.

Consider

$$v_3 = (0 \ 10 \ 0 \ 15)$$

Write down the vector equation of the plane  $P$  through the points  $v_1, v_2$  and  $v_3$ .

(Hint: Look at pages 21 and 22 in Lec 1)

7. (Challenge problem)

Write down the cartesian equation of plane  $P$  in problem 6.

(Hint: Don't look at pages 18-20 in Lec 1).