

Assignment 6, Due Monday, February 25:

Section 26: 4, 5, 6, 8

Section 27: 1, 2

Section 28: 6a

8. Let  $T_1 = \phi_1 + 3\phi_2 + 5\phi_3$ ,  $T_2 = -\phi_1 + 2\phi_2 + \phi_3$ ,  $T_3 = 2\phi_1 - \phi_2 + \phi_3$ .

i) Express  $T_1 \wedge T_2$  as a linear combination of elementary alternating 2-tensors.

ii) Express  $T_1 \wedge T_2 \wedge T_3$  as a linear combination of elementary alternating 3-tensors.

9. Let  $V$  be a finite dimensional vector space. Let  $w_1, \dots, w_k$  be elements of  $V^*$ . (Here  $k$  need not be the dimension of  $V$ .) Prove that  $w_1, \dots, w_k$  are linearly independent if and only if  $w_1 \wedge \dots \wedge w_k \neq 0$ .