

## Chapter 26 Problems

### Problem 1

$$\begin{aligned}
 v_i &= \langle \hat{e}_i | v \rangle \\
 &= \langle v | \hat{e}_i \rangle \\
 &= \langle v | R^T | \hat{e}'_i \rangle \\
 &= \sum_k \langle v | \hat{e}'_k \rangle \langle \hat{e}'_k | R^T | \hat{e}'_i \rangle \\
 &= \sum_k v'_k | \hat{e}'_k \rangle.
 \end{aligned}$$

### Problem 2

$$\begin{aligned}
 |v'\rangle &= v'_1 |\hat{e}_1\rangle + v'_2 |\hat{e}_2\rangle \\
 &= (v_1 \cos \phi - v_2 \sin \phi) |\hat{e}_1\rangle + (v_1 \sin \phi + v_2 \cos \phi) |\hat{e}_2\rangle \\
 &= v_1 (\cos \phi |\hat{e}_1\rangle + \sin \phi |\hat{e}_2\rangle) + v_2 (-\sin \phi |\hat{e}_1\rangle + \cos \phi |\hat{e}_2\rangle) \\
 &= v_1 |\hat{e}'_1\rangle + v_2 |\hat{e}'_2\rangle.
 \end{aligned}$$

This is a clockwise rotation of the unprimed basis.

### Problem 4

### Problem 5

### Problem 8

### Problem 11

### Problem 16

### Problem 18

### Problem 20

### Problem 21

## Chapter 27 Problems

### Problem 1

### Problem 2

### Problem 4

### Problem 6