## ANSWERS - VOLUME2: STRESSES, STRAINS, DISPLACEMENTS

problem 7.047, page 535

Remarks: See § 7.3, pages 504 to 513

## Answer

a)

| Member | Sign | $\Delta L  (\text{mm})$ |
|--------|------|-------------------------|
| 1      | -    | -2                      |
| 2      | 0    | 0                       |
| 3      | +    | 2                       |
| 4      | -    | $-2\sqrt{2}$            |
| 5      | 0    | 0                       |

Assuming the direction of BC is fixed:

| Joint | $u_x(mm)$ | $u_y$ (mm) |
|-------|-----------|------------|
| A     | 4         | 0          |
| В     | 0         | 0          |
| C     | 2         | -2         |
| D     | 0         | -4         |

b) The truss should be rotation  $1.333 \cdot 10^{-3}$  radians anti-clockwise  $(\frac{4 \cdot 10^{-3}}{})$ 

| Joint | $u_{x}$ (mm) | $u_y$ (mm) |
|-------|--------------|------------|
| A     | -4           | -8         |
| В     | 0            | 0          |
| C     | -4           | -4         |
| D     | 0            | -4         |

c) Combined displacements:

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|-----------------------|------------|------------|--|
| Joint                 | $u_x$ (mm) | $u_y$ (mm) |  |
| A                     | 0          | -8         |  |
| В                     | 0          | 0          |  |
| C                     | -2         | -6         |  |
| D                     | 0          | -8         |  |