Chapter 7, Deformation of Trusses

Remarks: See § 7.3, pages 504 to 513

Answer

a)

| Member | Forces | $\Delta L (\text{mm})$ |
|--------|---------------|-------------------------|
| 1 | 0 | 0 |
| 2 | $-\sqrt{2}$ F | $-4\sqrt{2}$ |
| 3 | $\sqrt{2}$ F | $4\sqrt{2}$ |
| 4 | -2 F | -4 |
| 5 | F | -4 |
| 6 | F | 4 |
| 7 | $-\sqrt{2}$ F | $-4\sqrt{2}$ |
| 8 | $-\sqrt{5}$ F | $-2\sqrt{5}$ |

b)Assuming the direction of AC is fixed and removing the support at B:

| Joint | $u_x(\text{mm})$ | u_y (mm) |
|-------|------------------|------------|
| A | 0 | 0 |
| В | 20 | 25 |
| C | -8 | 0 |
| D | 0 | 0 |
| Е | 4 | -20 |
| G | -12 | 4 |

c) The truss should be rotated $2.5 \cdot 10^{-3}$ radians clockwise $(\frac{25 \cdot 10^{-3}}{10})$

| Joint | u_x (mm) | u_y (mm) |
|-------|------------|------------|
| A | 0 | 0 |
| В | -20 | -25 |
| C | -10 | -10 |
| D | 0 | -20 |
| E | 0 | -30 |
| G | -10 | -20 |

d) Combined displacements:

| a) comomo dispide dinentis. | | | | |
|-----------------------------|------------|------------|--|--|
| Joint | u_x (mm) | u_y (mm) | | |
| A | 0 | 0 | | |
| В | 0 | 0 | | |
| C | -18 | 10 | | |
| D | 0 | -20 | | |
| E | 4 | -50 | | |
| G | -22 | -16 | | |

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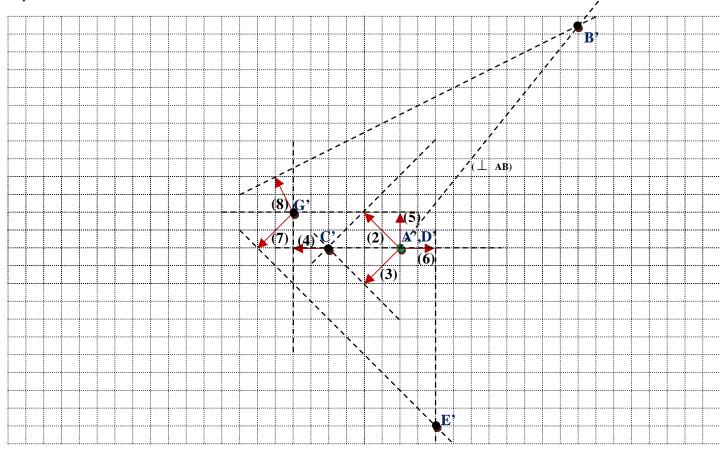
ANSWERS - VOLUME2: STRESSES, STRAINS, DISPLACEMENTS

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problem 7.055, page 537

Work out:

Scale: 1 Square = 2mm



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