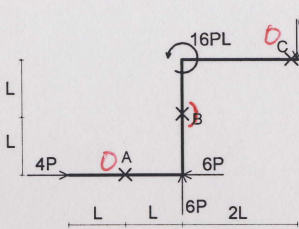


| | | | |
|---|-----------|----|----|
| 建築構造力学 I A・同演習 第4回 演習問題 実施日2013/5/8 | 学生証 番号 | 氏名 | 得点 |
|---|-----------|----|----|

問. 図中×印点での断面力(軸力N、せん断力Q、曲げモーメントM)を求めなさい。
また、曲げモーメントにより部材が伸びる側に(+)を、生じない場合には(0)を図中に書きなさい。

(1)



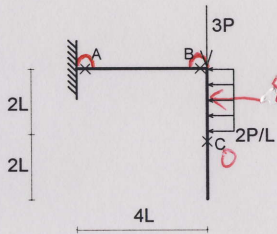
$A点$
 $\rightarrow 4P$
 $N + 4P = 0$
 $Q = 0$
 $M = 0$

$B点$
 $\leftarrow 6P$
 $\downarrow 6P$
 $Q + 4P - 6P = 0$
 $N + 6P = 0$
 $M - 4PL + 6PL = 0$

$C点$
 $\rightarrow 6P$
 $\downarrow 2P$
 $-N + 2P = 0$
 $Q - 6P = 0$
 $M = 0$

| | N | Q | M |
|---|-----|----|-----|
| A | -4P | 0 | 0 |
| B | -6P | 2P | 2PL |
| C | 2P | 6P | 0 |

(2)



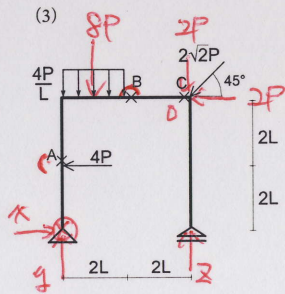
$A点$
 $N = 0$
 $Q = 0$
 $M = 0$

$B点$
 $\leftarrow 4P$
 $\downarrow 3P$
 $-N - 4P = 0$
 $Q - 3P = 0$
 $M + 4PL = 0$

$C点$
 $\leftarrow 2P/L$
 $\downarrow 2P/L$
 $-N - 4P = 0$
 $Q - 3P = 0$
 $M + 2PL + 4PL = 0$

| | N | Q | M |
|---|-----|----|------|
| A | -4P | 3P | 16PL |
| B | -4P | 3P | 4PL |
| C | 0 | 0 | 0 |

(3)



$A点$
 $\leftarrow 4P$
 $N - 4P = 0$
 $Q = 0$
 $M = 0$

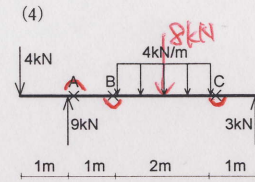
$B点$
 $\rightarrow 8P$
 $N - 2P = 0$
 $Q - 2P = 0$
 $M + 4PL = 0$

$C点$
 $\leftarrow 4P$
 $\downarrow 2P$
 $-N - 2P = 0$
 $Q - 2P = 0$
 $M = 0$

$x - 4P - 2P = 0$
 $y + z - 8P - 2P = 0$
 $-4zL - 8PL + 8PL = 0$
 $x = 6P, y = 10P, z = 0$

| | N | Q | M |
|---|------|-----|------|
| A | -10P | -2P | 12PL |
| B | -2P | 2P | 4PL |
| C | -2P | 2P | 0 |

(4)



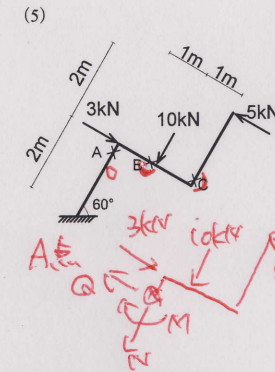
$A点$
 $\rightarrow 4kN$
 $N = 0$
 $Q = 0$
 $M = 0$

$B点$
 $\uparrow 9kN$
 $\downarrow 8kN$
 $N = 0$
 $-Q - 4kN + 9kN = 0$
 $M - 8kNm + 9kNm = 0$

$C点$
 $\rightarrow 3kN$
 $\downarrow 8kN$
 $-N = 0$
 $Q + 3kN = 0$
 $M - 3kNm = 0$

| | N | Q | M |
|---|---|------|------|
| A | 0 | 5kN | 4kNm |
| B | 0 | 5kN | 1kNm |
| C | 0 | -3kN | 3kNm |

(5)



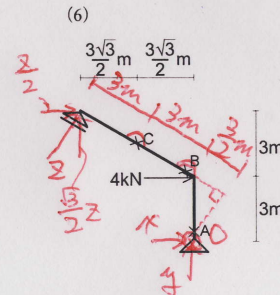
$A点$
 $N = 0$
 $Q = 0$
 $M = 0$

$B点$
 $\rightarrow 3kN$
 $\downarrow 10kN$
 $N = 0$
 $Q + 5kN = 0$
 $M - 10kNm = 0$

$C点$
 $\rightarrow 5kN$
 $\downarrow 5kN$
 $-N - 10kN = 0$
 $-Q + 3kN - 5kN = 0$
 $M + 10kNm - 10kNm = 0$

| | N | Q | M |
|---|-------|------|-------|
| A | -10kN | -2kN | 0 |
| B | -5kN | 10kN | 10kNm |
| C | 0 | -5kN | 10kNm |

(6)



$x + \frac{2}{2} + 4kN = 0$
 $y + \frac{\sqrt{3}}{2} z = 0$
 $z \times \frac{15}{2} m + 12kNm = 0$
 $z = -\frac{8}{5} kN$
 $x = -\frac{16}{5} kN$
 $y = \frac{4\sqrt{3}}{5} kN$

$A点$
 $N = 0$
 $Q = 0$
 $M = 0$

$B点$
 $\rightarrow 4kN$
 $\downarrow 16kN$
 $N = 0$
 $Q - \frac{16}{5} kN = 0$
 $M = 0$

$C点$
 $\rightarrow 16kN$
 $\downarrow \frac{4\sqrt{3}}{5} kN$
 $N = 0$
 $Q + \frac{16}{5} kN = 0$
 $M - \frac{8}{5} kN \times 6m = 0$

| | N | Q | M |
|---|---|--------|---|
| A | 0 | 0 | 0 |
| B | 0 | -3.2kN | 0 |
| C | 0 | -3.2kN | 0 |