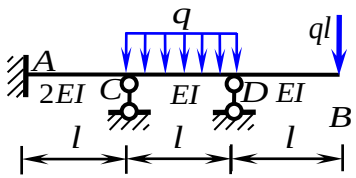
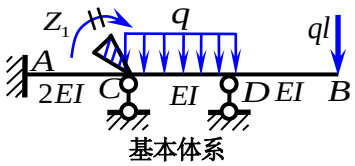
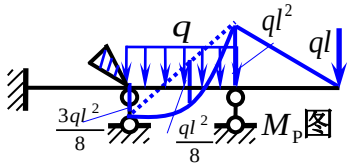
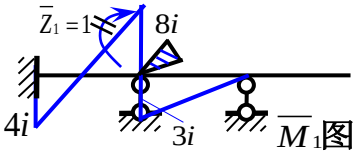
【例题1】用位移法作弯矩图。（梁1-1）



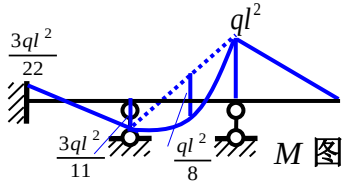




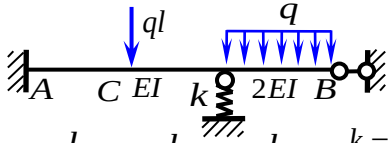


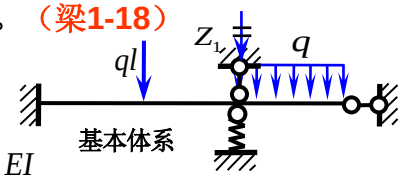
令线刚度：$i=EI/l$

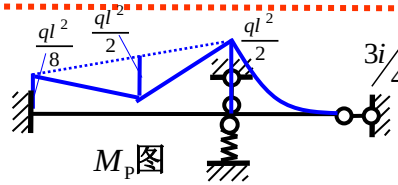
$k_{11}Z_1+F_{1P}=0$　$k_{11}=11i$　$F_{1P}=3ql^2/8$　$Z_1=-3ql^2/88i$　$M=\overline{M}_1Z_1+M_P$

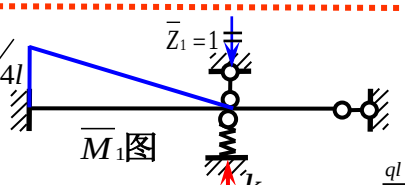


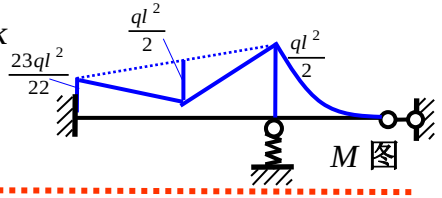
【例题2】用位移法作弯矩图。（梁1-18）







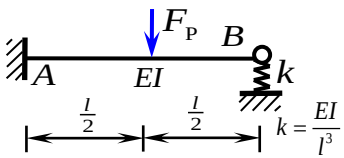


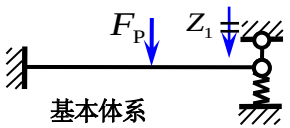


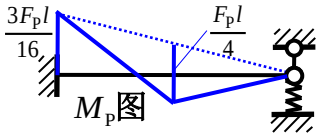
$k=\dfrac{EI}{l^3}$　令线刚度：$i=EI/l$

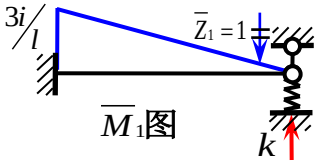
$k_{11}Z_1+F_{1P}=0$　$k_{11}=3i/8l^2+k=11i/8l^2$　$F_{1P}=-27ql/16$　$Z_1=27ql^3/22i$　$M=\overline{M}_1Z_1+M_P$

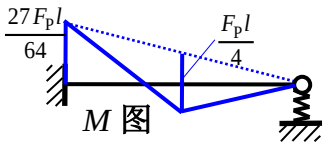
【例题3】用位移法作弯矩图。（梁1-21）





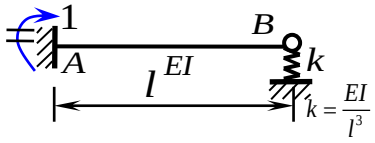


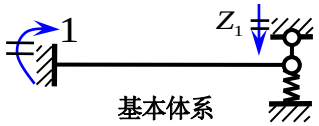


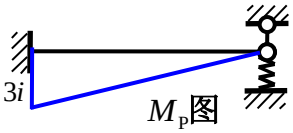


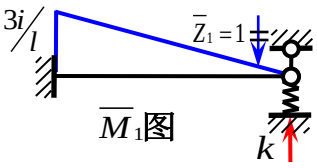
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=3i/l^2+k=4i/l^2$　$F_{1P}=-5F_P/16$　$Z_1=5F_Pl^2/64i$　$M=\overline{M}_1Z_1+M_P$

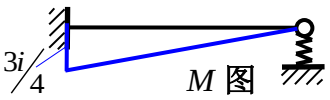
【例题4】用位移法作弯矩图。（梁1-23）





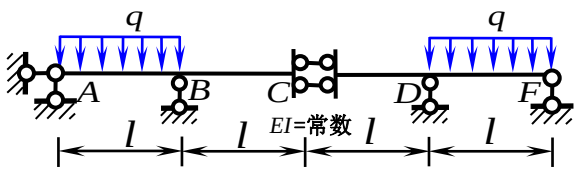


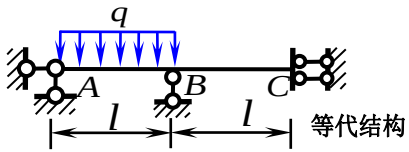


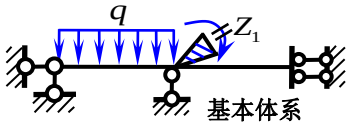


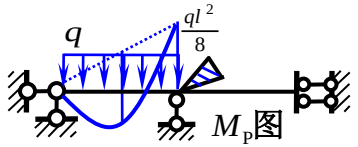
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=3i/l^2+k=4i/l^2$　$F_{1P}=-3i/l$　$Z_1=3l/4$　$M=\overline{M}_1Z_1+M_P$

【例题5】用位移法作弯矩图。（梁1-25）

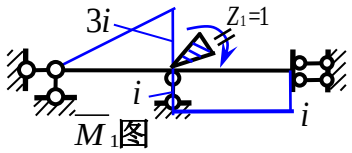


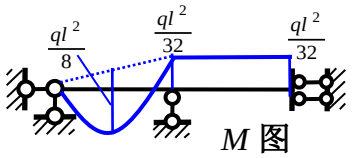


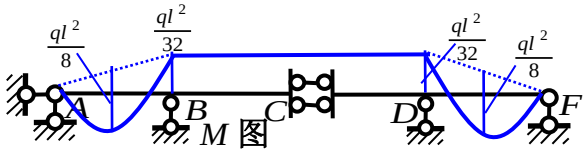




令线刚度：$i=EI/l$

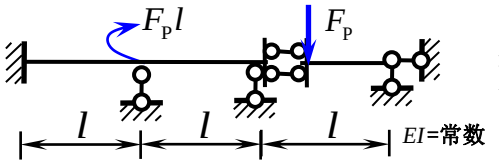


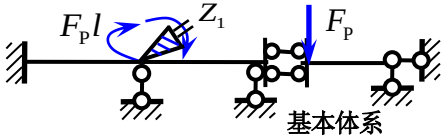


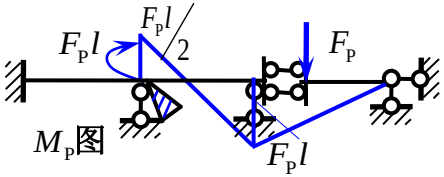


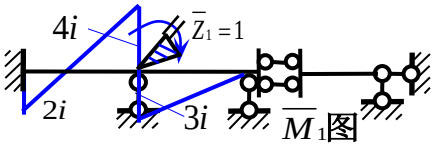
$k_{11}Z_1+F_{1P}=0$　$k_{11}=4i$　$F_{1P}=ql^2/8$　$F_{1P}=ql^2/8$　$M=\overline{M}_1Z_1+M_P$

【例题6】用位移法作弯矩图。（梁1-3）



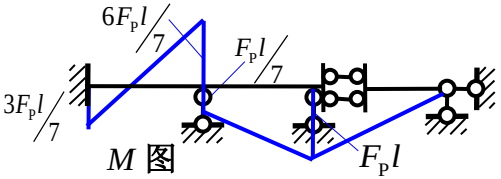




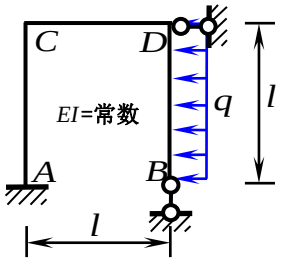


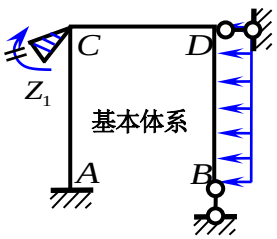
令线刚度：$i=EI/l$

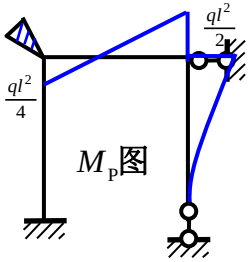
$k_{11}Z_1+F_{1P}=0$　$k_{11}=7i$　$F_{1P}=-3F_Pl/2$　$Z_1=3F_Pl/14i$　$M=\overline{M}_1Z_1+M_P$

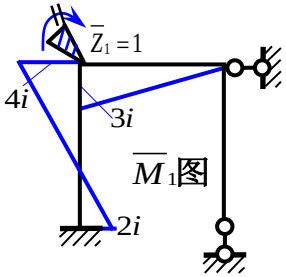


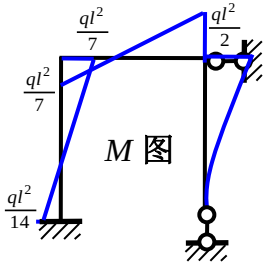
【例题7】用位移法作弯矩图。（刚架1-12）





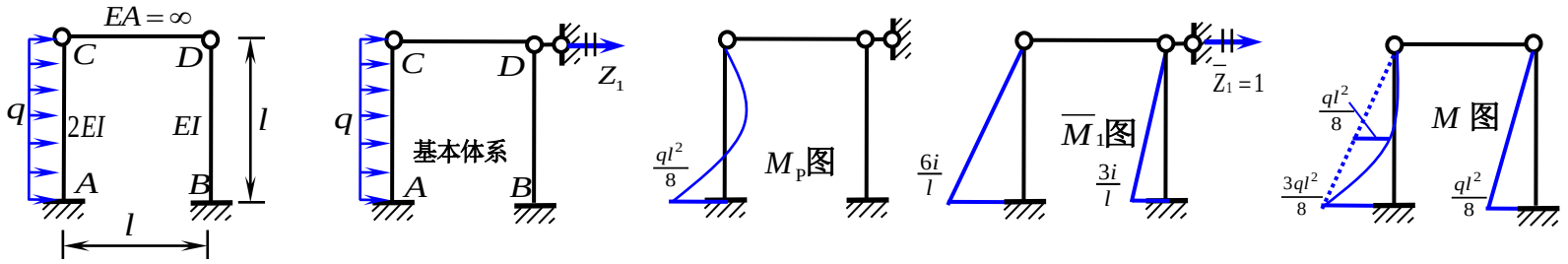






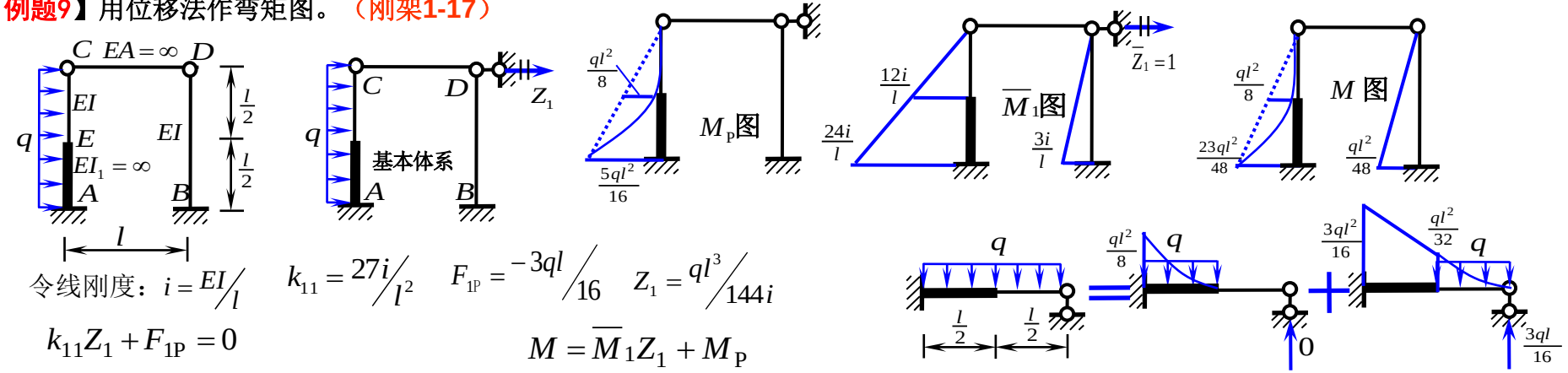
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=7i$　$F_{1P}=ql^2/4$　$Z_1=-ql^2/28i$　$M=\overline{M}_1Z_1+M_P$

【例题8】用位移法作弯矩图。（刚架1-13）



令线刚度：$i=EI/l$　　$k_{11}Z_1+F_{1P}=0$　　$k_{11}=9i/l^2$　　$F_{1P}=-3ql/8$　　$Z_1=ql^3/24i$　　$M=\overline{M}_1Z_1+M_P$

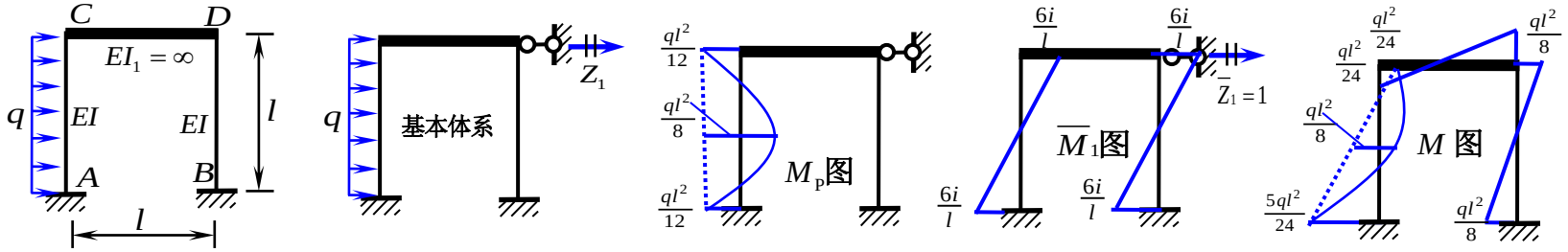
【例题9】用位移法作弯矩图。（刚架1-17）



令线刚度：$i=EI/l$　　$k_{11}=27i/l^2$　　$F_{1P}=-3ql/16$　　$Z_1=ql^3/144i$

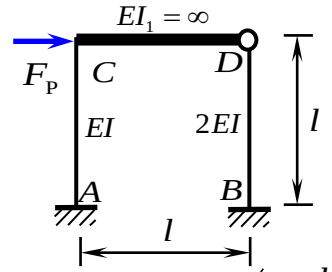
$k_{11}Z_1+F_{1P}=0$　　$M=\overline{M}_1Z_1+M_P$

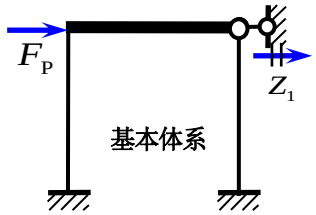
【例题10】用位移法作弯矩图。（刚架1-22）

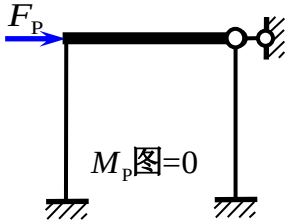


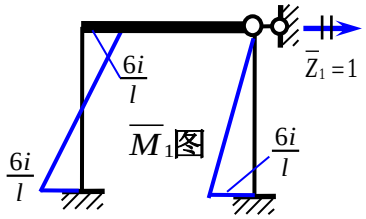
令线刚度：$i=EI/l$　　$k_{11}Z_1+F_{1P}=0$　　$k_{11}=24i/l^2$　　$F_{1P}=-ql/2$　　$Z_1=ql^3/48i$　　$M=\overline{M}_1Z_1+M_P$

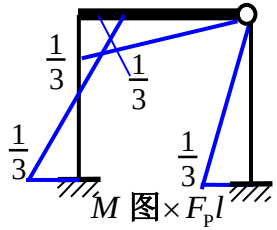
【例题11】用位移法作弯矩图。（刚架1-2）





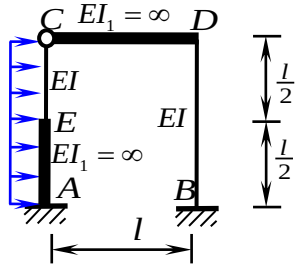


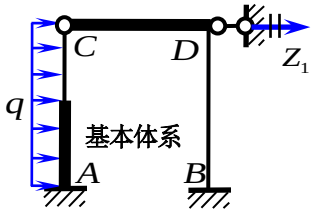


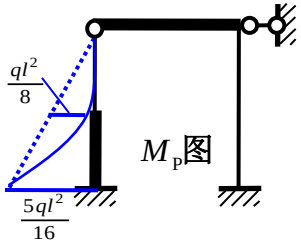


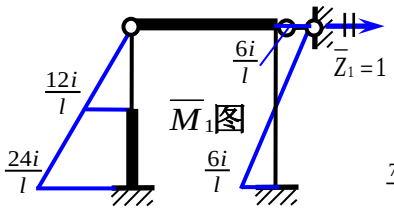
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=18i/l^2$　$F_{1P}=-F_P$　$Z_1=F_P l^2/18i$　$M=\overline{M}_1 Z_1+M_P$

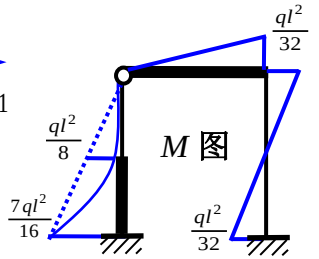
【例题12】用位移法作弯矩图。（刚架1-26）





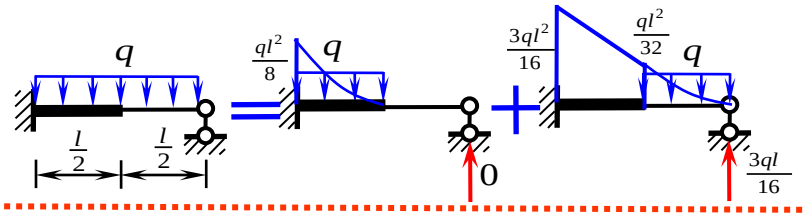




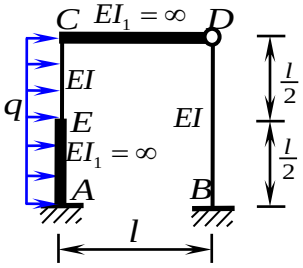


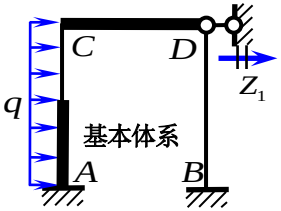
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=36i/l^2$

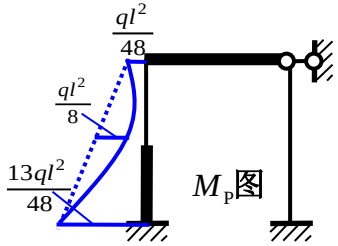
$F_{1P}=-3ql/16$　$Z_1=ql^3/192i$　$M=\overline{M}_1 Z_1+M_P$

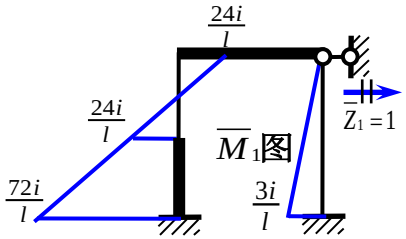


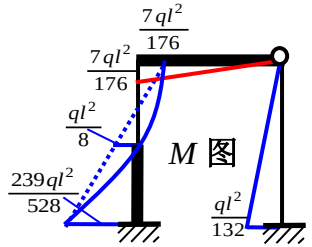
【例题13】用位移法作弯矩图。（刚架1-27）





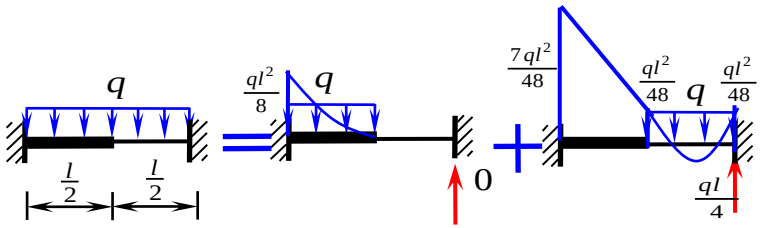




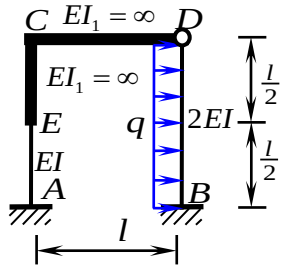


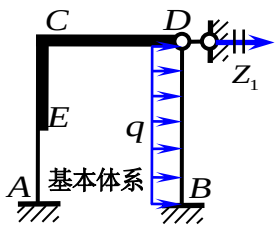
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=99i/l^2$

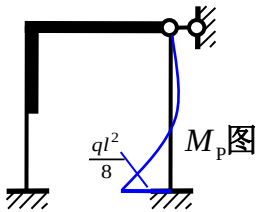
$F_{1P}=-ql/4$　$Z_1=ql^3/396i$　$M=\overline{M}_1 Z_1+M_P$

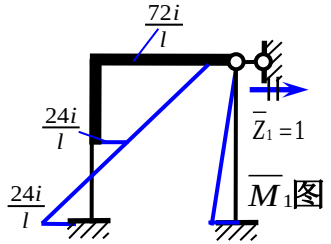


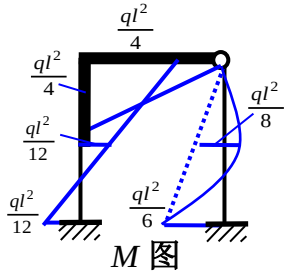
【例题14】用位移法作弯矩图。（刚架1-29）





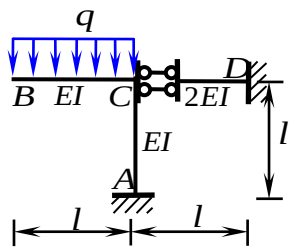


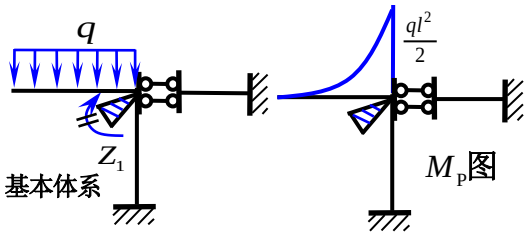


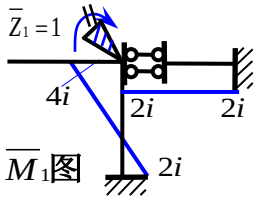


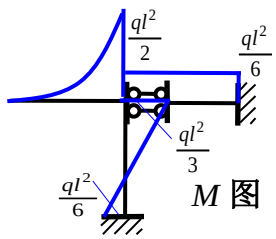
令线刚度：$i=EI/l$　　$k_{11}Z_1+F_{1P}=0$　　$k_{11}=102i/l^2$　　$F_{1P}=-3ql/8$　　$Z_1=ql^3/144i$　　$M=\overline{M}_1Z_1+M_P$

【例题15】用位移法作弯矩图。（刚架1-33）



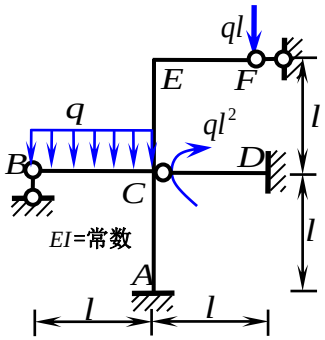


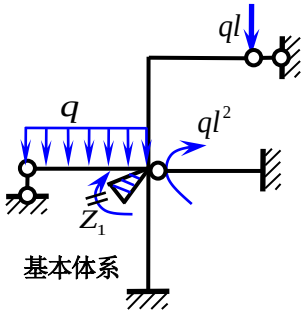


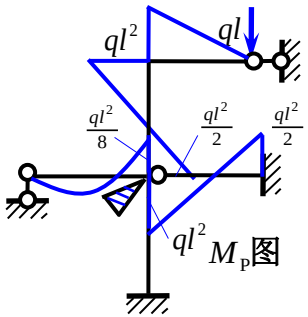


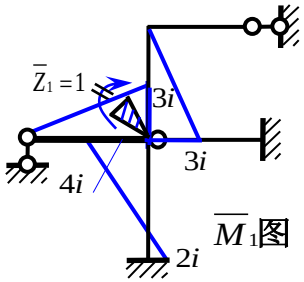
令线刚度：$i=EI/l$　　$k_{11}Z_1+F_{1P}=0$　　$k_{11}=6i$　　$F_{1P}=ql^2/2$　　$Z_1=-ql^2/12i$　　$M=\overline{M}_1Z_1+M_P$

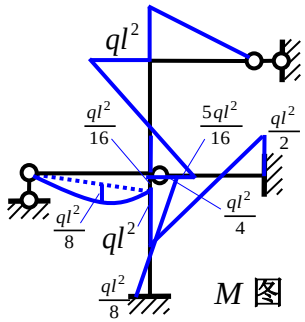
【例题16】用位移法作弯矩图。（刚架1-34）





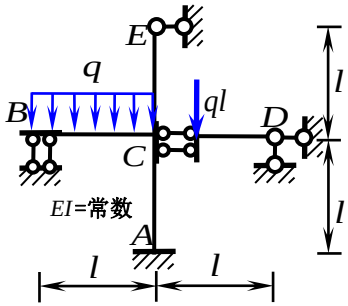


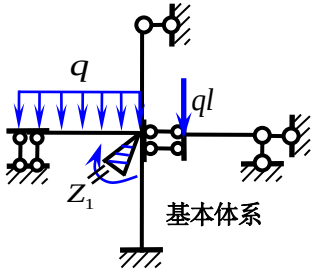


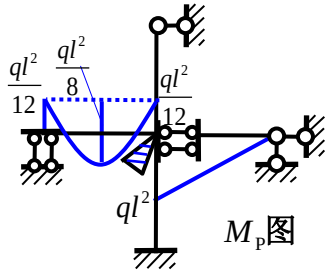


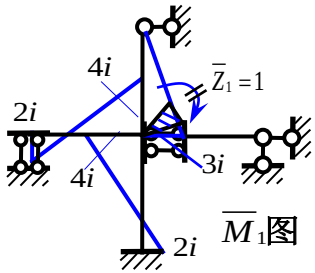
令线刚度：$i=EI/l$　　$k_{11}Z_1+F_{1P}=0$　　$k_{11}=10i$　　$F_{1P}=5ql^2/8$　　$Z_1=-ql^2/16i$　　$M=\overline{M}_1Z_1+M_P$

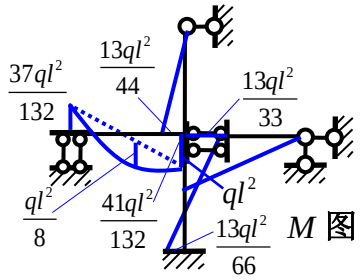
【例题17】用位移法作弯矩图。（刚架1-37）





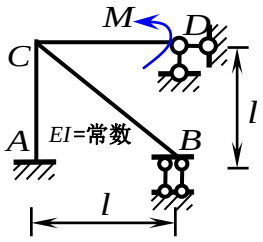


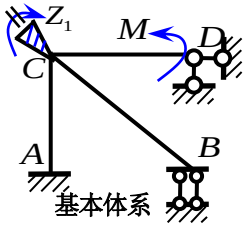


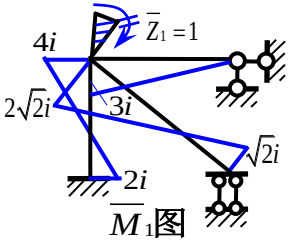


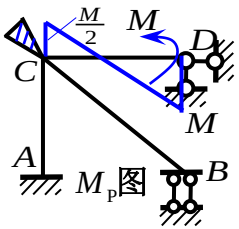
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 11i$　　$F_{1P} = 13ql^2/12$　　$Z_1 = -13ql^2/132i$　　$M = \overline{M}_1 Z_1 + M_P$

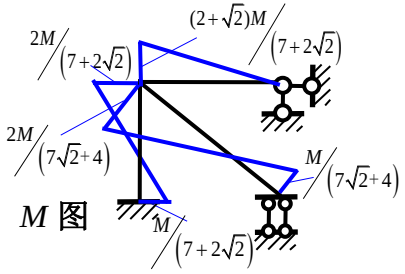
【例题18】用位移法作弯矩图。（刚架1-39）





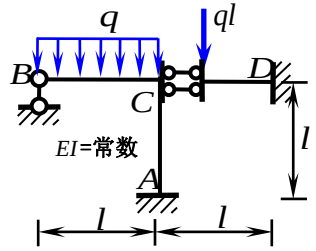


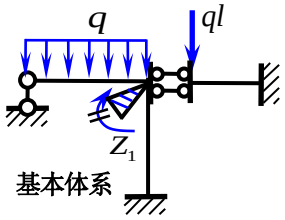


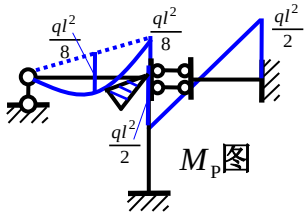


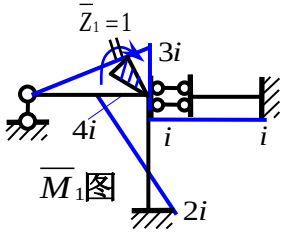
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 7i + 2\sqrt{2}i$　　$F_{1P} = -M/2$　　$Z_1 = -F_{1P}/k_{11} = \dfrac{M}{(14+4\sqrt{2})i}$　　$M = \overline{M}_1 Z_1 + M_P$

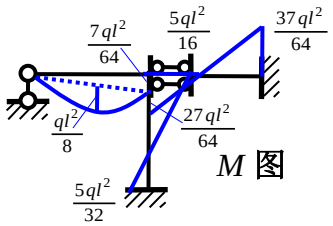
【例题19】用位移法作弯矩图。（刚架1-2）





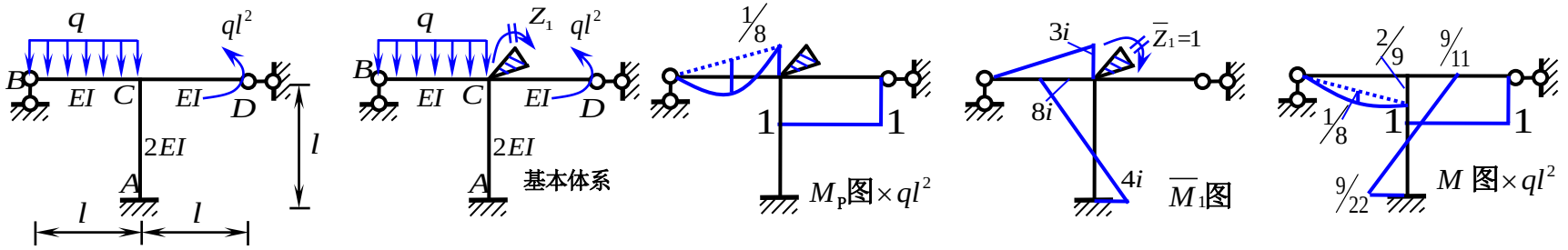






令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 8i$　　$F_{1P} = 5ql^2/8$　　$Z_1 = -5ql^2/64i$　　$M = \overline{M}_1 Z_1 + M_P$

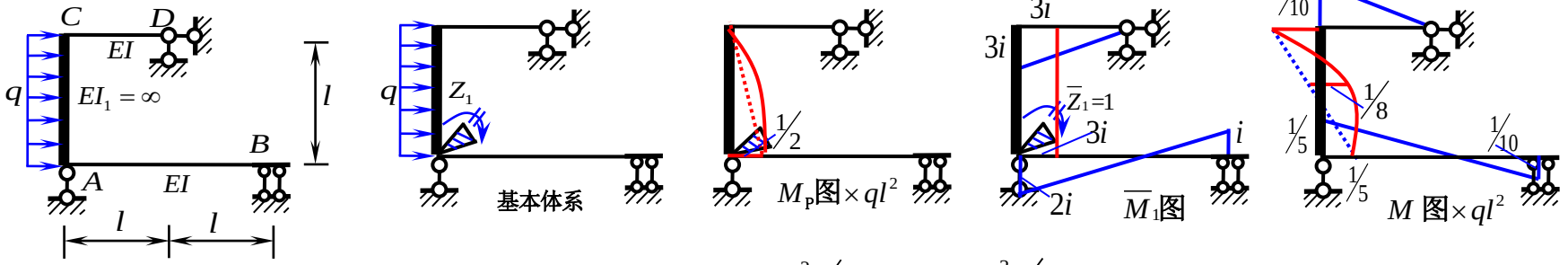
【例题20】用位移法作弯矩图。（刚架5-1）



令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=11i$　$F_{1P}=9ql^2/8$　$Z_1=-9ql^2/88i$　$M=\overline{M}_1Z_1+M_P$

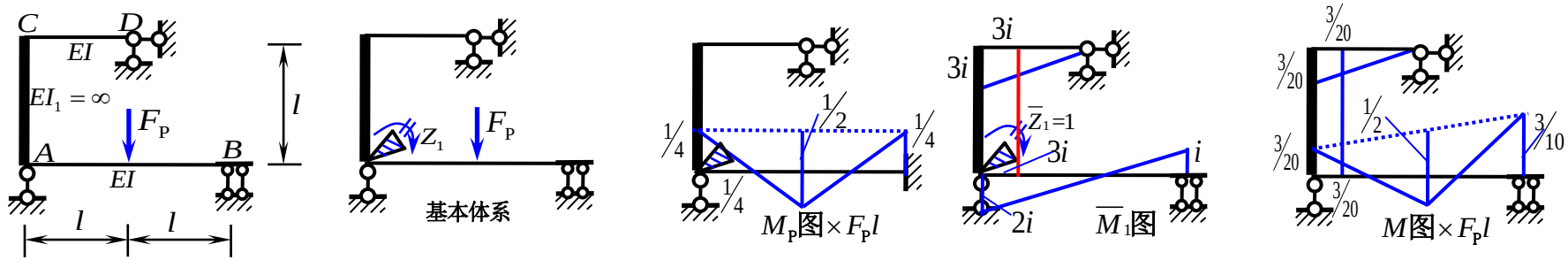
注：无穷刚杆弯矩图由平衡条件得到

【例题21】用位移法作弯矩图。（刚架5-2）



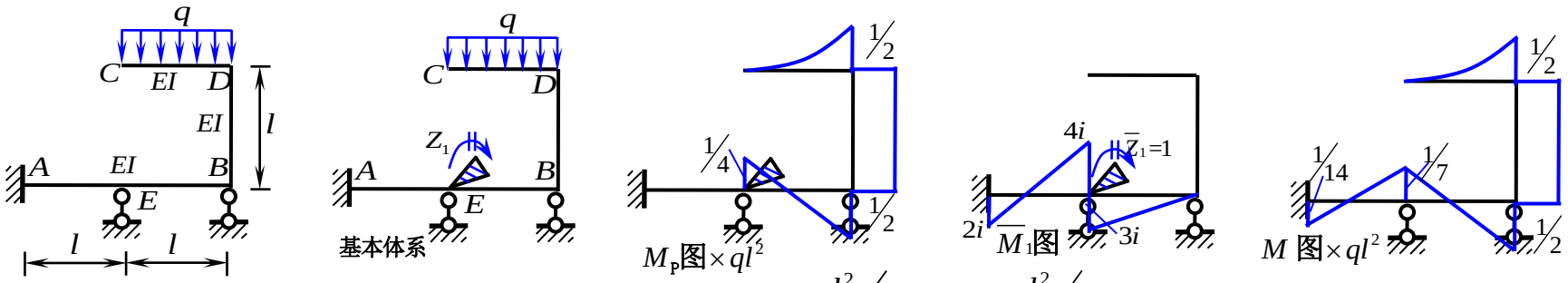
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=5i$　$F_{1P}=ql^2/2$　$Z_1=-ql^2/10i$　$M=\overline{M}_1Z_1+M_P$

【例题22】用位移法作弯矩图。（刚架5-5）



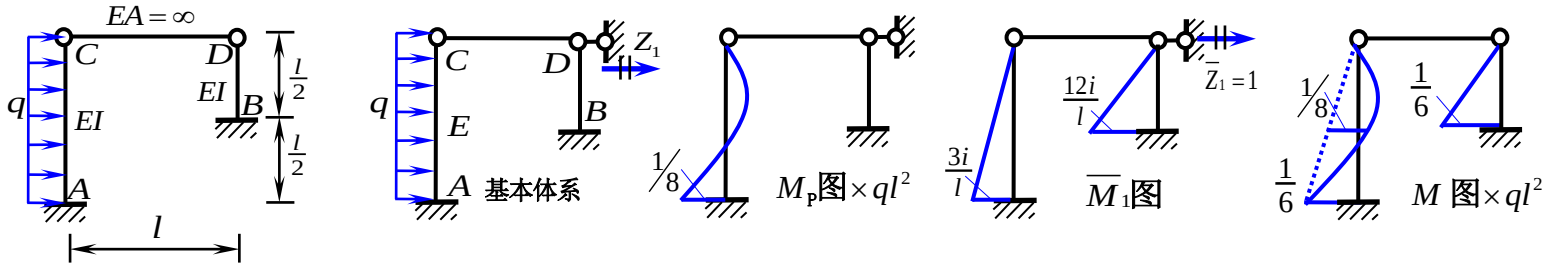
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=5i$　$F_{1P}=-F_Pl/4$　$Z_1=F_Pl/20i$　$M=\overline{M}_1Z_1+M_P$

【例题23】用位移法作弯矩图。（刚架5-11）



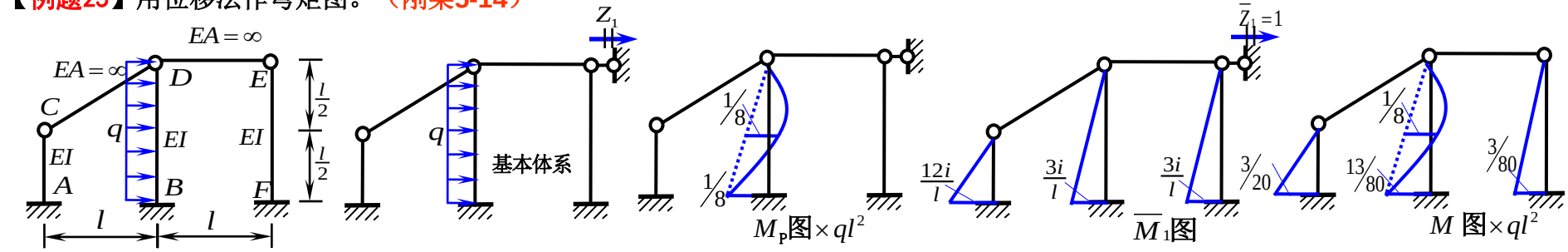
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 7i$　　$F_{1P} = -ql^2/4$　　$Z_1 = ql^2/28i$　　$M = \overline{M}_1 Z_1 + M_P$

【例题24】用位移法作弯矩图。（刚架5-13）



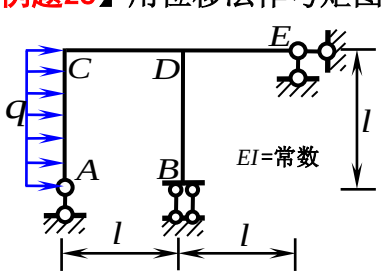
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 27i/l^2$　　$F_{1P} = -3ql/8$　　$Z_1 = ql^3/72i$　　$M = \overline{M}_1 Z_1 + M_P$

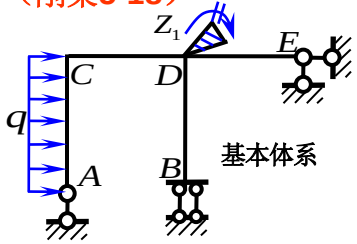
【例题25】用位移法作弯矩图。（刚架5-14）

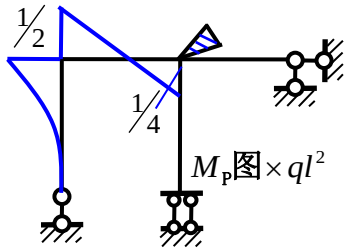


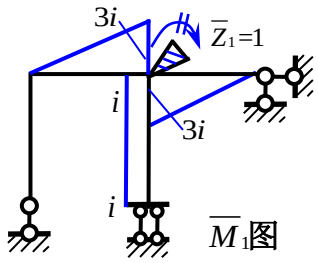
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 30i/l^2$　　$F_{1P} = -3ql/8$　　$Z_1 = ql^3/80i$　　$M = \overline{M}_1 Z_1 + M_P$

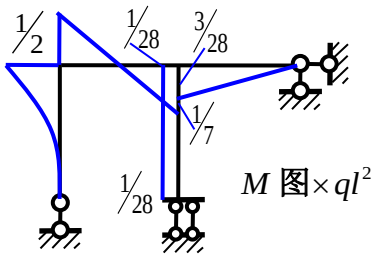
【例题26】用位移法作弯矩图。（刚架5-18）







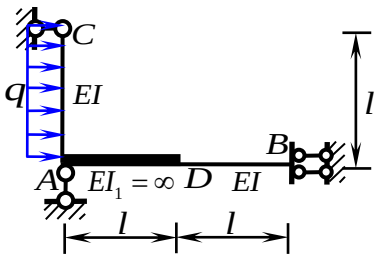


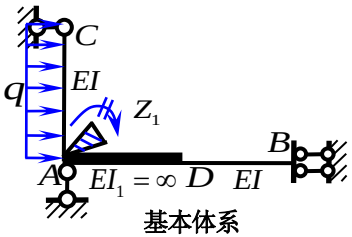


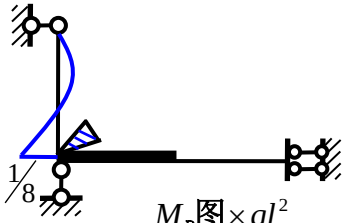
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=7i$　$F_{1P}=-ql^2/4$　$Z_1=ql^2/28i$　$M=\overline{M}_1Z_1+M_P$

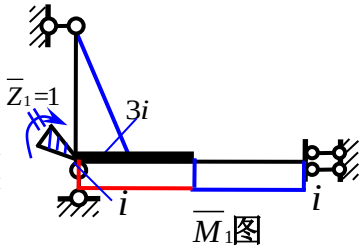
【例题27】用位移法作弯矩图。（刚架5-22（方法1））

无穷刚杆件的弯矩图由平衡条件得到

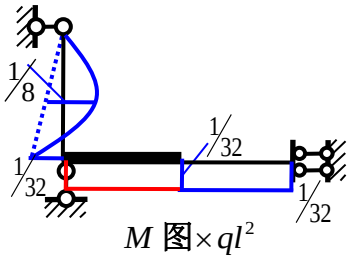




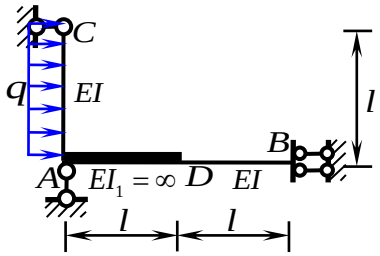


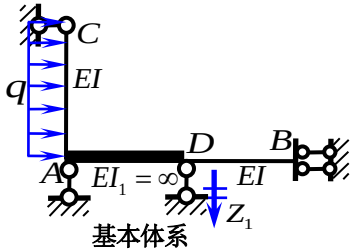


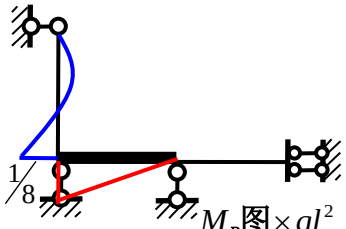
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=4i$　$F_{1P}=-ql^2/8$　$Z_1=ql^2/32i$　$M=\overline{M}_1Z_1+M_P$

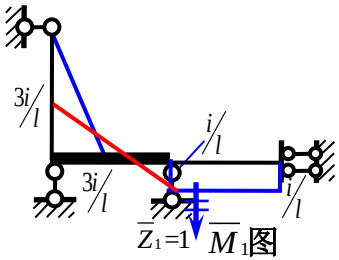


【例题28】用位移法作弯矩图。（刚架5-22(方法2)）



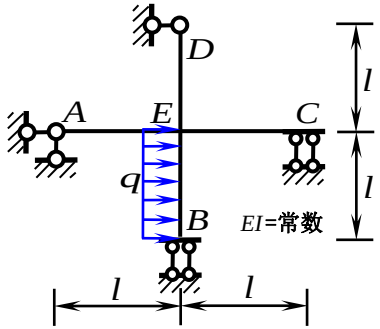


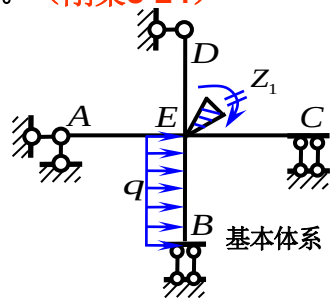


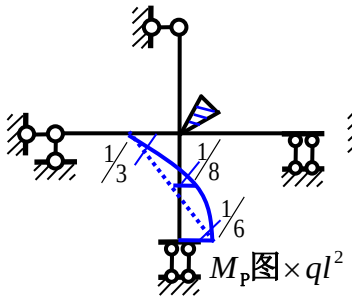


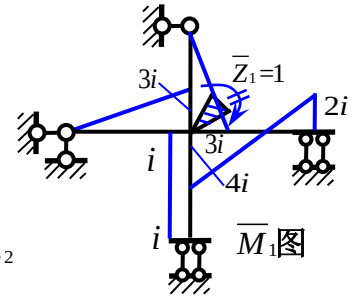
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=4i/l^2$　$F_{1P}=-ql/8$　$Z_1=ql^3/32i$　$M=\overline{M}_1Z_1+M_P$

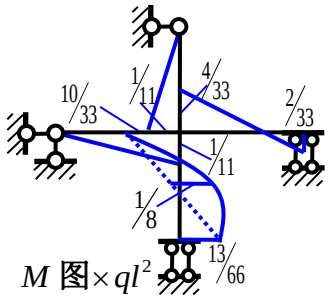
【例题29】用位移法作弯矩图。（刚架5-24）





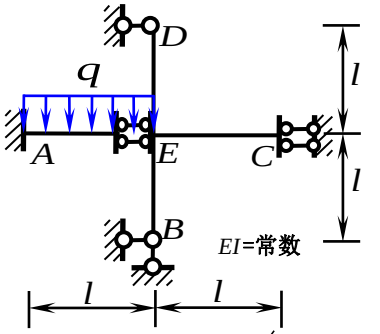


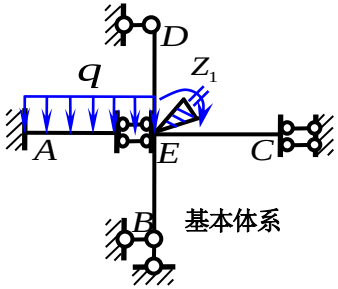


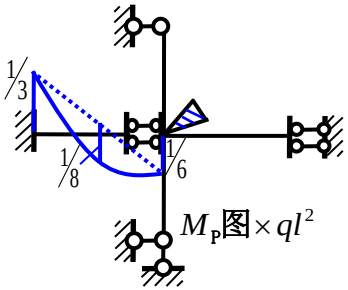


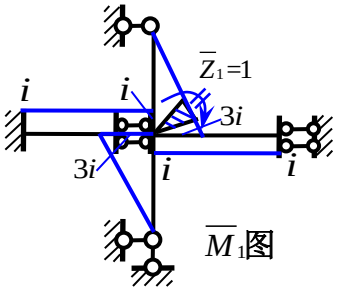
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=11i$　$F_{1P}=ql^2/3$　$Z_1=-ql^2/33i$　$M=\overline{M}_1Z_1+M_P$

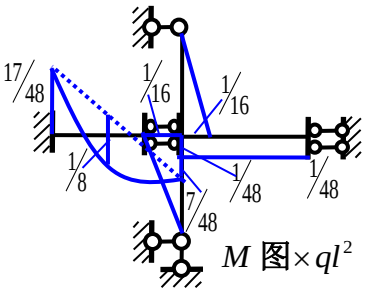
【例题30】用位移法作弯矩图。（刚架5-27）





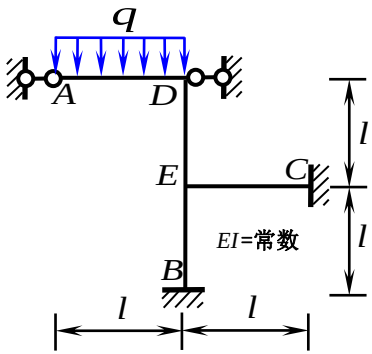


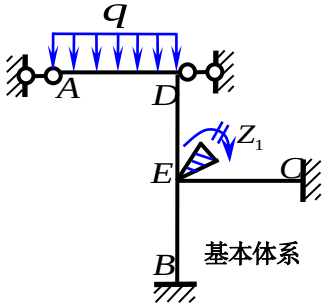


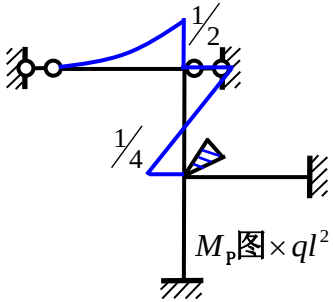


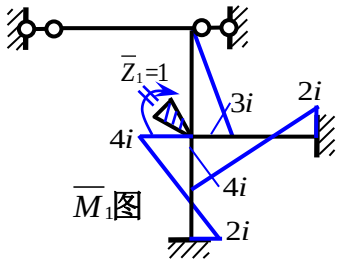
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=8i$　$F_{1P}=-ql^2/6$　$Z_1=ql^2/48i$　$M=\overline{M}_1Z_1+M_P$

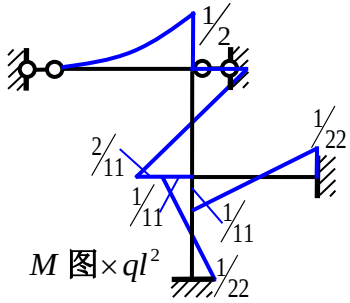
【例题31】用位移法作弯矩图。（刚架5-30）





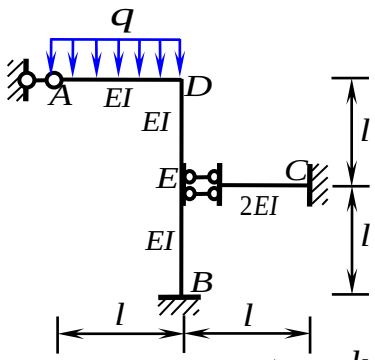


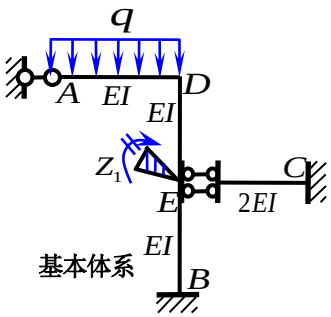


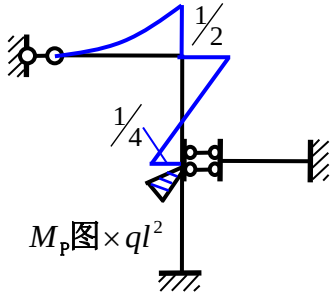


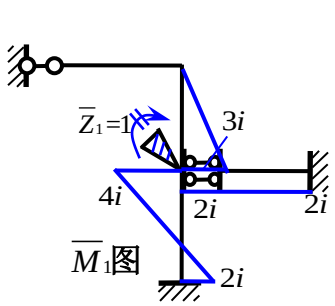
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=11i$　$F_{1P}=-ql^2/4$　$Z_1=ql^2/44i$　$M=\overline{M}_1Z_1+M_P$

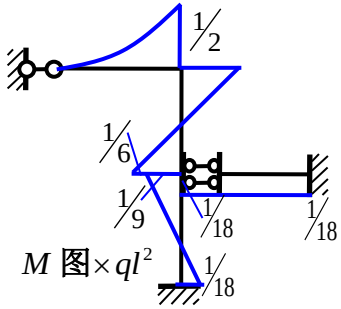
【例题32】用位移法作弯矩图。（刚架5-32）





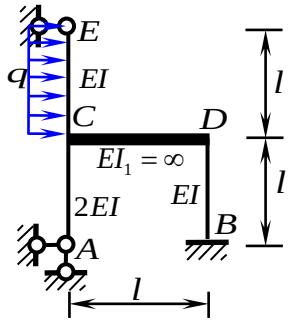


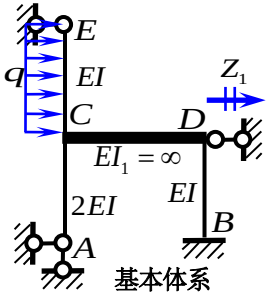


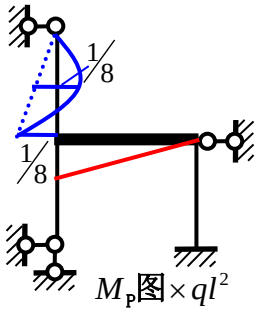


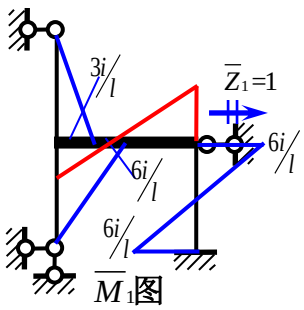
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 9i$　　$F_{1P} = -ql^2/4$　　$Z_1 = ql^2/36i$　　$M = \overline{M}_1 Z_1 + M_P$

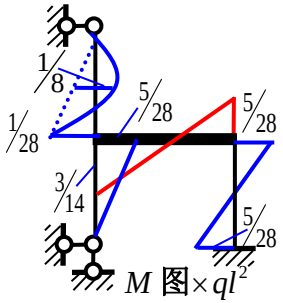
【例题33】用位移法作弯矩图。（刚架5-37）





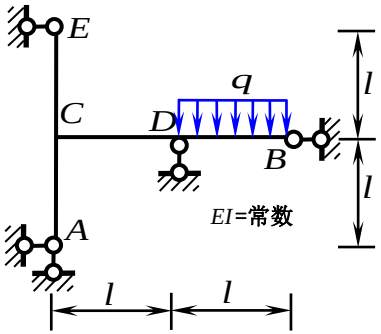


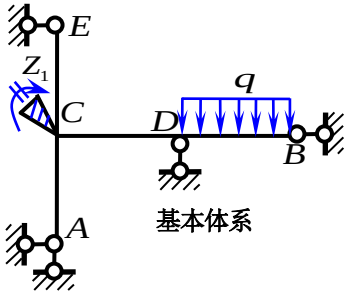


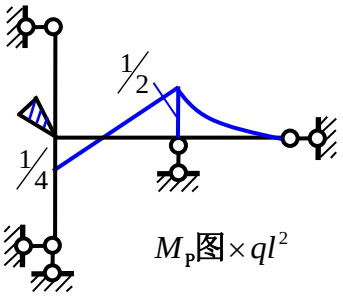


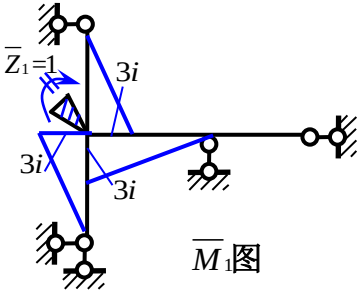
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 21i/l^2$　　$F_{1P} = -5ql/8$　　$Z_1 = 5ql^3/168i$　　$M = \overline{M}_1 Z_1 + M_P$

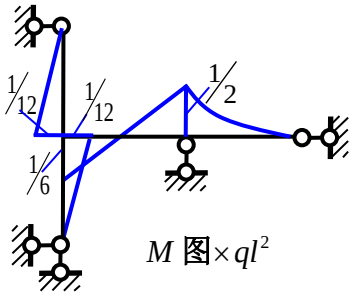
【例题34】用位移法作弯矩图。（刚架5-40）





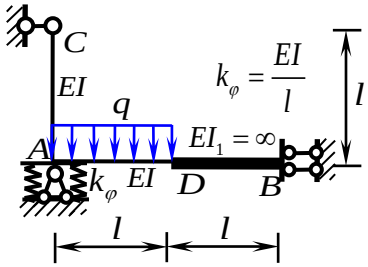


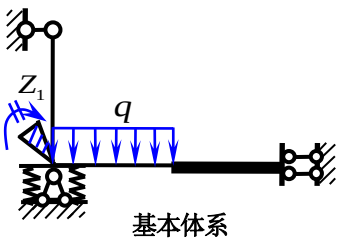


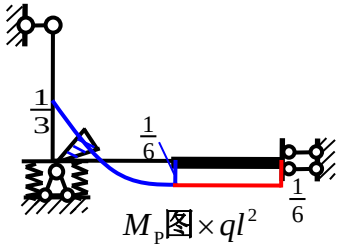


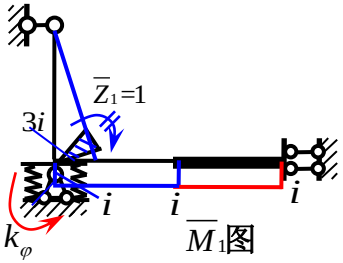
令线刚度：$i = EI/l$　　$k_{11}Z_1 + F_{1P} = 0$　　$k_{11} = 9i$　　$F_{1P} = ql^2/4$　　$Z_1 = -ql^3/36i$　　$M = \overline{M}_1 Z_1 + M_P$

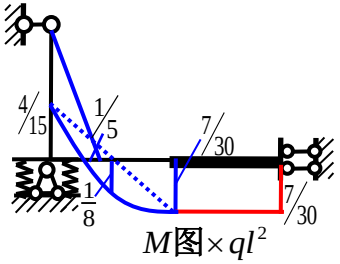
【例题35】用位移法作弯矩图。（刚架6-25）





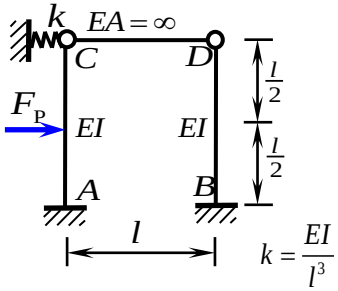


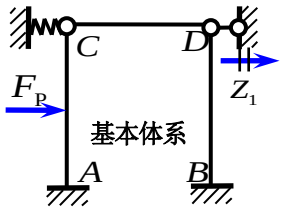


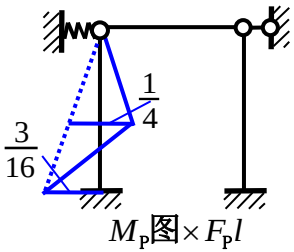


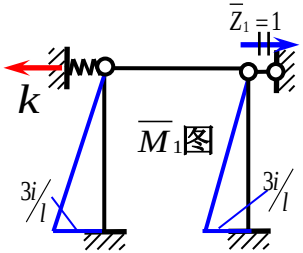
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=5i$　$F_{1P}=-ql^2/3$　$Z_1=ql^2/15i$　$M=\bar{M}_1Z_1+M_P$

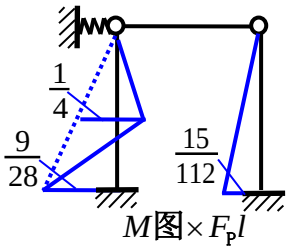
【例题36】用位移法作弯矩图。（刚架弹簧1-2）





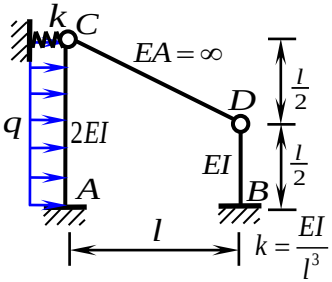


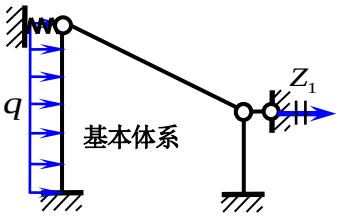


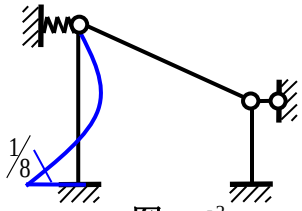


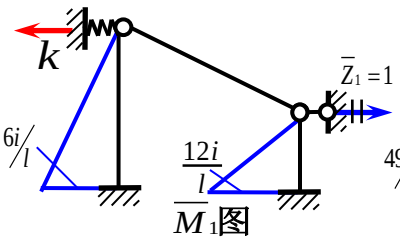
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=7i/l^2$　$F_{1P}=-5F_P/16$　$Z_1=5F_Pl^2/112i$　$M=\bar{M}_1Z_1+M_P$

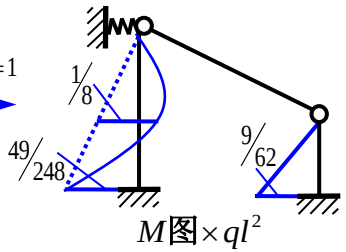
【例题37】用位移法作弯矩图。（刚架弹簧1-5）





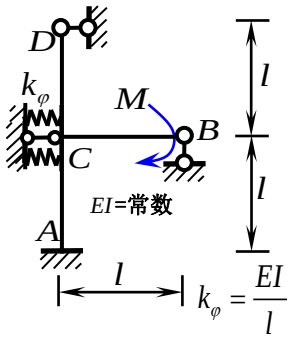


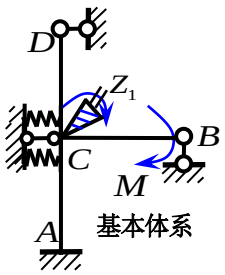


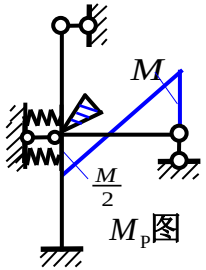


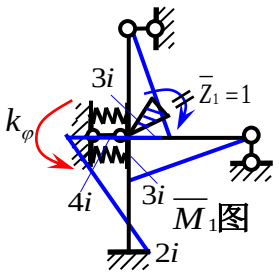
令线刚度：$i=EI/l$　$k_{11}Z_1+F_{1P}=0$　$k_{11}=31i/l^2$　$F_{1P}=-3ql/8$　$Z_1=3ql^3/248i$　$M=\bar{M}_1Z_1+M_P$

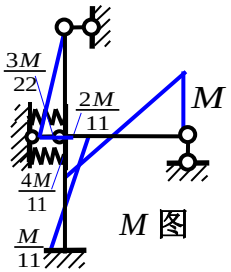
【例题38】用位移法作弯矩图。（刚架弹簧1-16）











令线刚度：$i = EI/l$

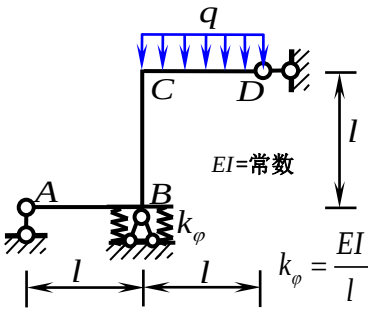
$k_{11}Z_1 + F_{1P} = 0$

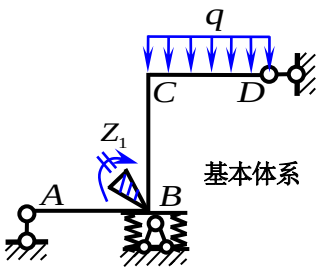
$k_{11} = 11i \quad Z_1 = -M/22i$

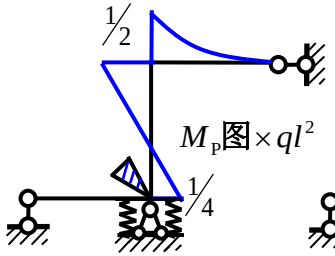
$F_{1P} = M/2$

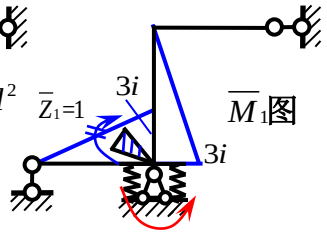
$M = \overline{M}_1 Z_1 + M_P$

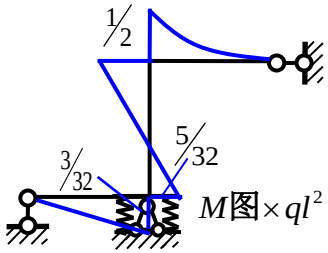
【例题39】用位移法作弯矩图。（刚架弹簧1-25）





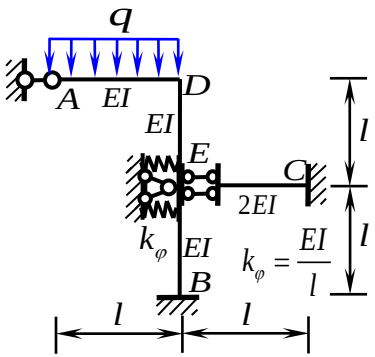


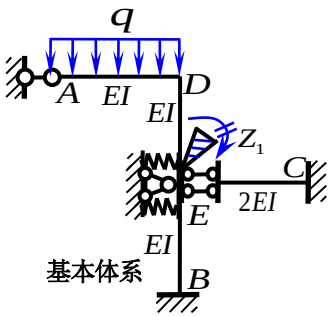


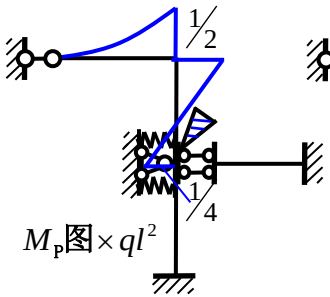


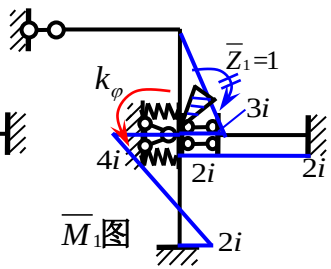
令线刚度：$i = EI/l$　$k_{11}Z_1 + F_{1P} = 0$　$k_{11} = 8i$　$F_{1P} = ql^2/4$　$Z_1 = -ql^2/32i$　$M = \overline{M}_1 Z_1 + M_P$

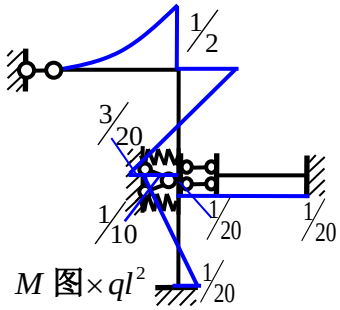
【例题40】用位移法作弯矩图。（刚架弹簧1-28）





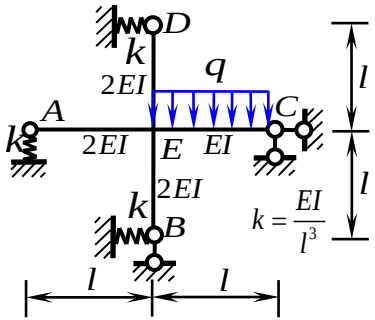


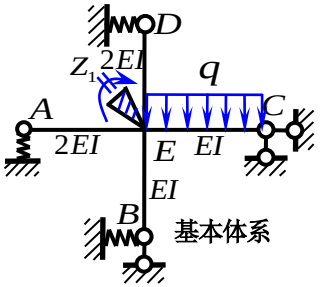


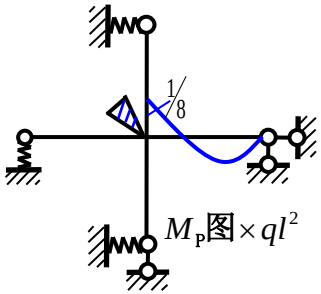


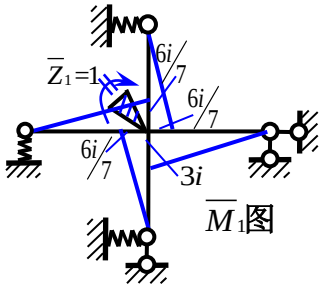
令线刚度：$i = EI/l$　$k_{11}Z_1 + F_{1P} = 0$　$k_{11} = 10i$　$F_{1P} = -ql^2/4$　$Z_1 = ql^2/40i$　$M = \overline{M}_1 Z_1 + M_P$

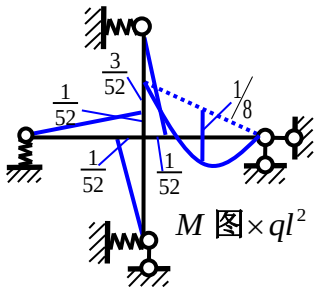
【例题41】用位移法作弯矩图。（刚架弹簧1-27）











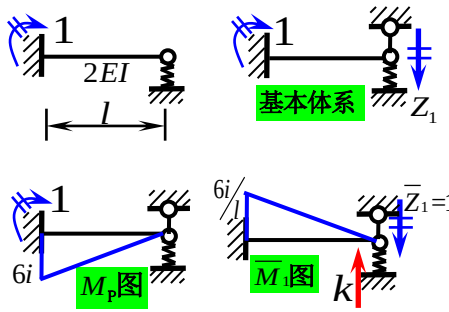
令线刚度：$i=EI/l$

$k_{11}Z_1+F_{1P}=0$

$k_{11}=39i/7$　$F_{1P}=-ql^2/8$

$Z_1=7ql^2/312i$

$M=\overline{M}_1Z_1+M_P$

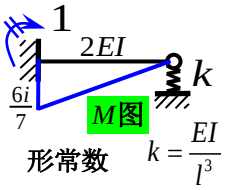


$k_{11}Z_1+F_{1P}=0$

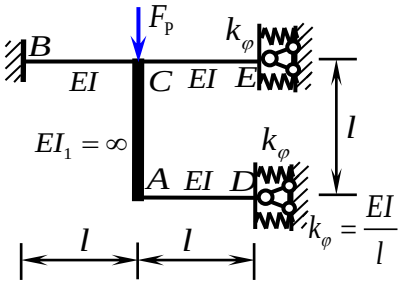
$k_{11}=7i/l^2$　$F_{1P}=-6i/l$

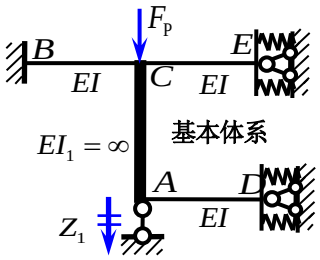
$Z_1=6l/7$

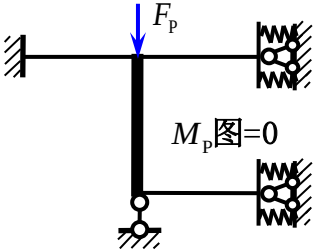
$M=\overline{M}_1Z_1+M_P$

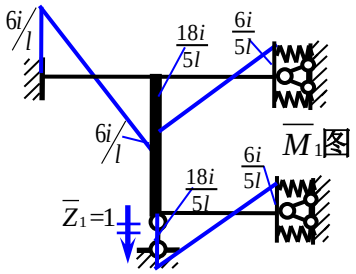


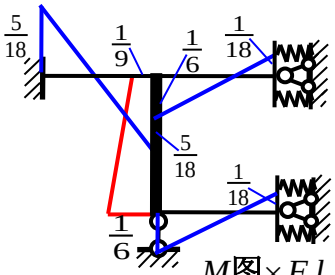
【例题42】用位移法作弯矩图。（刚架弹簧1-33）











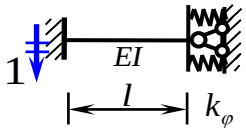
令线刚度：$i=EI/l$

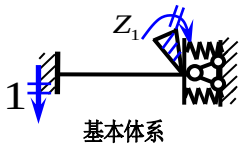
$k_{11}Z_1+F_{1P}=0$

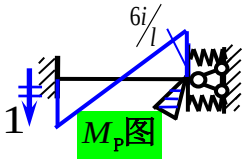
$k_{11}=108i/5l^2$　$F_{1P}=-F_P$

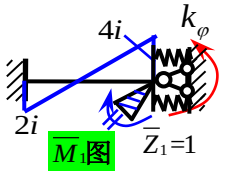
$Z_1=5F_Pl^2/108i$

$M=\overline{M}_1Z_1+M_P$







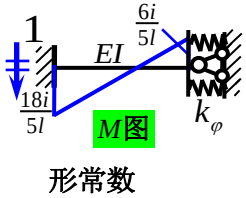


$k_{11}Z_1+F_{1P}=0$

$k_{11}=5i$　$F_{1P}=6i/l$

$Z_1=-6/5l$

$M=\overline{M}_1Z_1+M_P$



【例题1】用位移法作弯矩图。（梁1-2）

$$k_{11}Z_1 + F_{1P} = 0$$

$$M = \overline{M}_1 Z_1 + M_P$$

令线刚度：$i = EI/l$

【例题2】用位移法作弯矩图。（梁1-2）

$$k_{11}Z_1 + F_{1P} = 0$$

$$M = \overline{M}_1 Z_1 + M_P$$