

Fixed End Moments

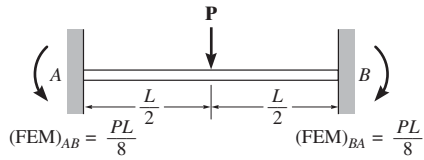


Diagram of a beam of length L fixed at both ends A and B , with a central point load P . The fixed end moments are:

$$(FEM)_{AB} = \frac{PL}{8} \quad (FEM)_{BA} = \frac{PL}{8}$$

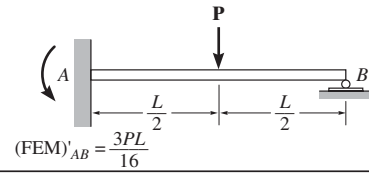


Diagram of a beam of length L fixed at A and pinned at B , with a central point load P . The fixed end moment is:

$$(FEM)'_{AB} = \frac{3PL}{16}$$

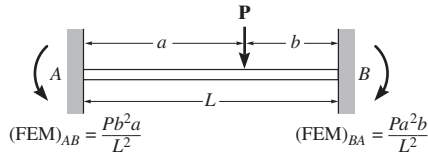


Diagram of a beam of length L fixed at both ends A and B , with a point load P at distance a from A and b from B . The fixed end moments are:

$$(FEM)_{AB} = \frac{Pb^2a}{L^2} \quad (FEM)_{BA} = \frac{Pa^2b}{L^2}$$

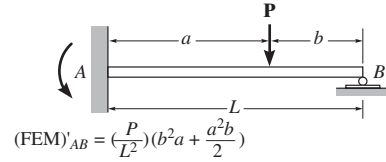


Diagram of a beam of length L fixed at A and pinned at B , with a point load P at distance a from A and b from B . The fixed end moment is:

$$(FEM)'_{AB} = \left(\frac{P}{L^2}\right)(b^2a + \frac{a^2b}{2})$$

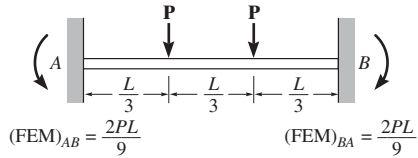


Diagram of a beam of length L fixed at both ends A and B , with three equally spaced point loads P . The fixed end moments are:

$$(FEM)_{AB} = \frac{2PL}{9} \quad (FEM)_{BA} = \frac{2PL}{9}$$

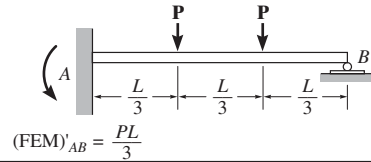


Diagram of a beam of length L fixed at A and pinned at B , with three equally spaced point loads P . The fixed end moment is:

$$(FEM)'_{AB} = \frac{PL}{3}$$

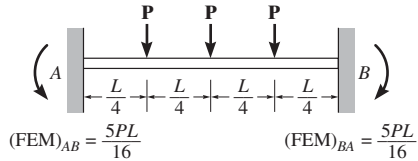


Diagram of a beam of length L fixed at both ends A and B , with four equally spaced point loads P . The fixed end moments are:

$$(FEM)_{AB} = \frac{5PL}{16} \quad (FEM)_{BA} = \frac{5PL}{16}$$

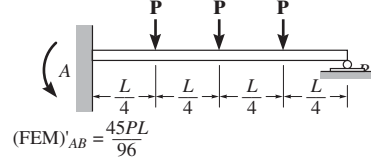


Diagram of a beam of length L fixed at A and pinned at B , with four equally spaced point loads P . The fixed end moment is:

$$(FEM)'_{AB} = \frac{45PL}{96}$$

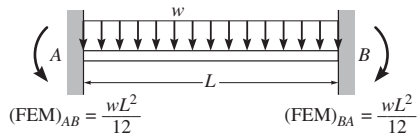


Diagram of a beam of length L fixed at both ends A and B , with a uniformly distributed load w . The fixed end moments are:

$$(FEM)_{AB} = \frac{wL^2}{12} \quad (FEM)_{BA} = \frac{wL^2}{12}$$

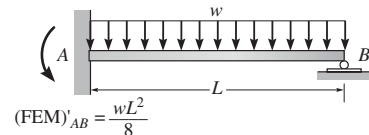


Diagram of a beam of length L fixed at A and pinned at B , with a uniformly distributed load w . The fixed end moment is:

$$(FEM)'_{AB} = \frac{wL^2}{8}$$

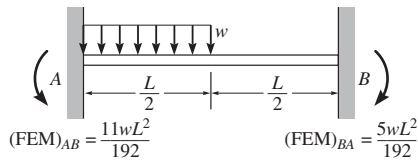


Diagram of a beam of length L fixed at both ends A and B , with a triangularly distributed load w . The fixed end moments are:

$$(FEM)_{AB} = \frac{11wL^2}{192} \quad (FEM)_{BA} = \frac{5wL^2}{192}$$

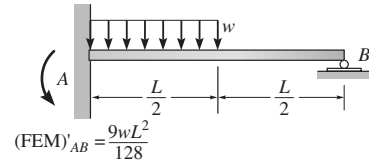


Diagram of a beam of length L fixed at A and pinned at B , with a triangularly distributed load w . The fixed end moment is:

$$(FEM)'_{AB} = \frac{9wL^2}{128}$$

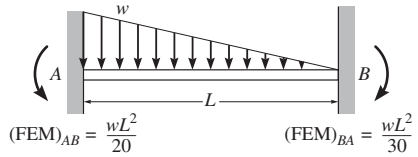


Diagram of a beam of length L fixed at both ends A and B , with a triangularly distributed load w . The fixed end moments are:

$$(FEM)_{AB} = \frac{wL^2}{20} \quad (FEM)_{BA} = \frac{wL^2}{30}$$

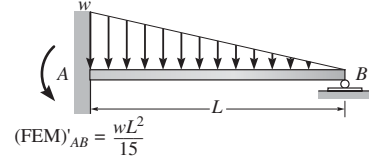


Diagram of a beam of length L fixed at A and pinned at B , with a triangularly distributed load w . The fixed end moment is:

$$(FEM)'_{AB} = \frac{wL^2}{15}$$

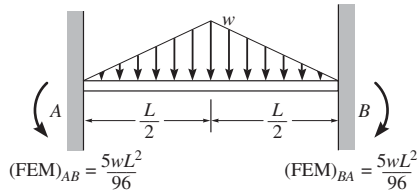


Diagram of a beam of length L fixed at both ends A and B , with a triangularly distributed load w . The fixed end moments are:

$$(FEM)_{AB} = \frac{5wL^2}{96} \quad (FEM)_{BA} = \frac{5wL^2}{96}$$

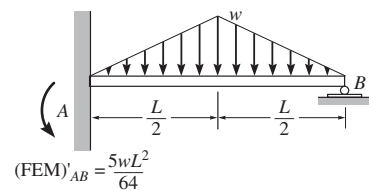


Diagram of a beam of length L fixed at A and pinned at B , with a triangularly distributed load w . The fixed end moment is:

$$(FEM)'_{AB} = \frac{5wL^2}{64}$$

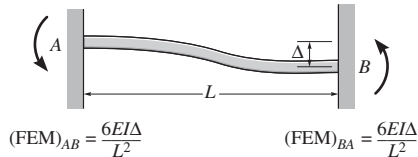


Diagram of a beam of length L fixed at both ends A and B , with a vertical displacement Δ at B . The fixed end moments are:

$$(FEM)_{AB} = \frac{6EI\Delta}{L^2} \quad (FEM)_{BA} = \frac{6EI\Delta}{L^2}$$

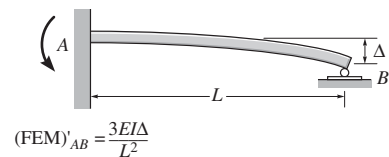


Diagram of a beam of length L fixed at A and pinned at B , with a vertical displacement Δ at B . The fixed end moment is:

$$(FEM)'_{AB} = \frac{3EI\Delta}{L^2}$$