Conceptual Question C9.1
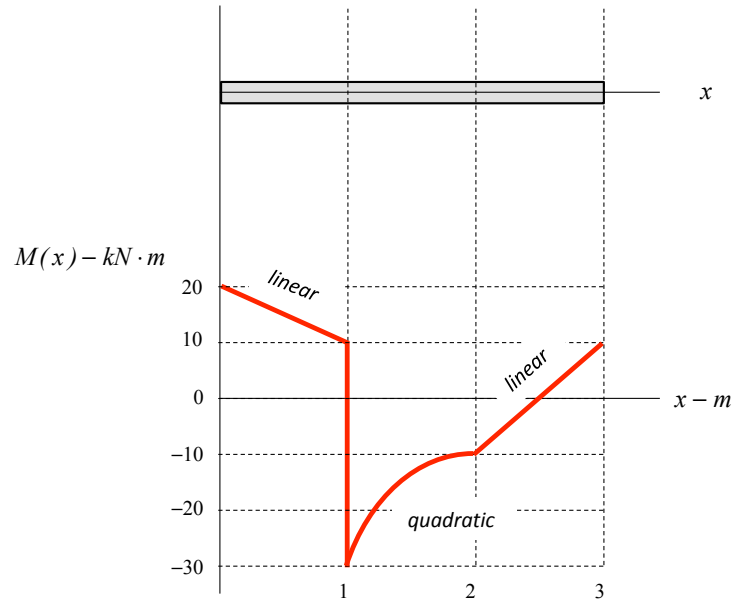
Given: A set of loads (not shown) on a beam produce the bending moment diagram provided below.

Find:

Make a sketch of the loading on the beam that produces the bending moment diagram shown. Provide an explanation for your answer.

Conceptual Question C9.2

Given: A beam is loaded as shown below.

Find: Circle the letter of the appropriate shear and bending moment diagrams shown below. Nate that the correct shear and moment diagrams do not necessarily appear next to each other.

(a)

(a)

(b)

(b)

(c)

(c)

(d)

(d)
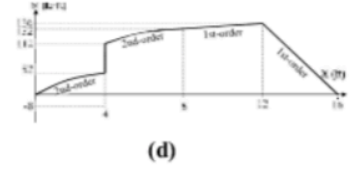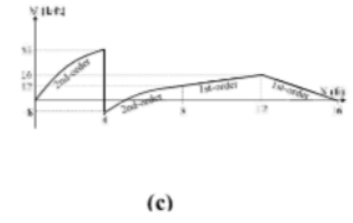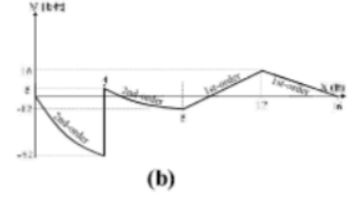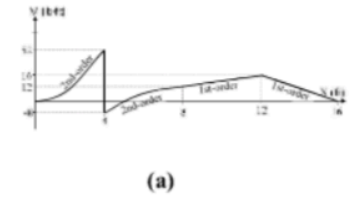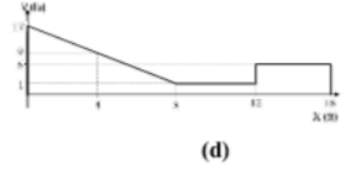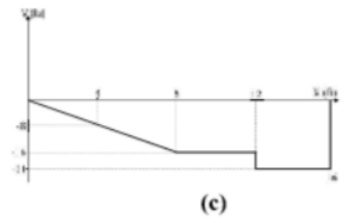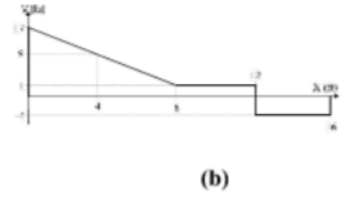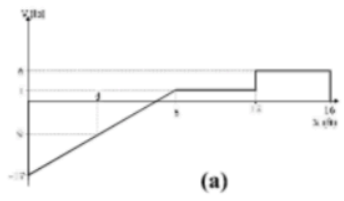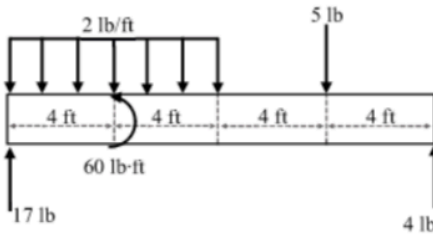
Conceptual Question C9.3

Given: The cantilevered beam is loaded with only concentrated forces and couples. This loading is unknown; however the bending moment diagram is as shown above. The beam has a square cross section of dimensions (0.5×0.5) ft.

Find: Determine the maximum shear force in the beam.
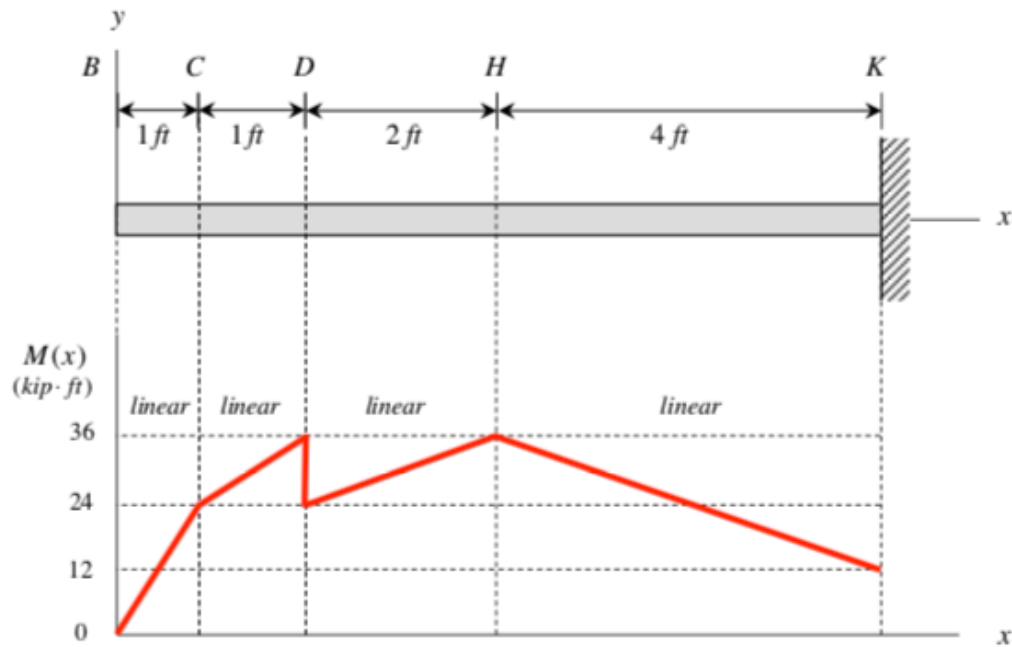
Conceptual Question C9.4

Given: A cantilevered beam is loaded as shown below.

Find: Circle the figure below that most accurately describes the internal shear force resultant in the beam between locations B and C.

P

M

x

B   C   D   H   K

V(x) x   V(x) x   V(x) x   V(x) x

B   C   B   C   B   C   B   C

V(x) x   V(x) x   V(x) x   V(x) x

B   C   B   C   B   C   B   C
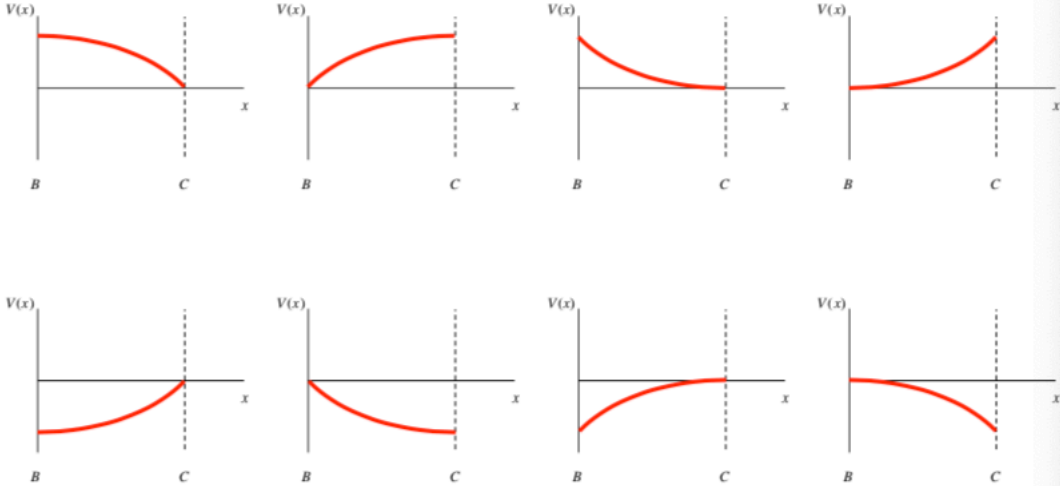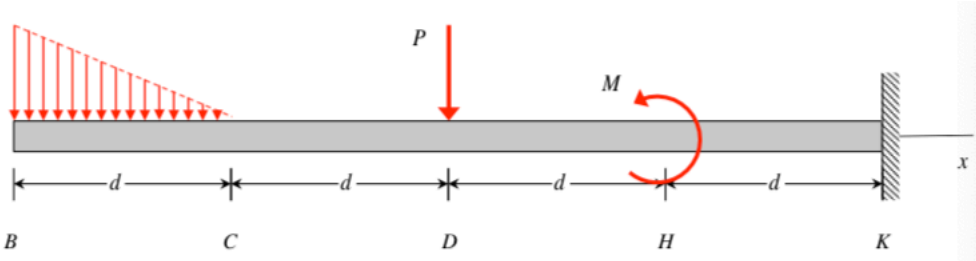
Conceptual Question C9.5

Given: A pair of beams experience distributed loadings acting over their length.

Find: Respond to the two questions below regarding the resulting bending moment distributions.

Which schematic corresponds to a beam whose bending moment is equal to

$$M(x) = \frac{x\, w_0 L}{10} - \frac{w_0\, x^3}{6L}$$

Circle the correct answer   (a)   (b)   (c)   (d)   (e)   (f)   (g)   (h)   (i)   (j)

Which schematic corresponds to a beam whose bending moment is equal to

$$M(x) = \frac{w_0\, x^4}{12} - \frac{w_0\, L\, x^3}{6}$$

Circle the correct answer   (a)   (b)   (c)   (d)   (e)   (f)   (g)   (h)   (i)   (j)

HINT: Identify which supports and loads are compatible with the given bending moments.