Solutions

2.1

- Symmetric span: $R = P/2 = \mathbf{5}$ kN each.
- $M_{max} = PL/4 = 10 \times 5/4 = \mathbf{12.5}$ kN · m at mid-span.

2.2

- $R = wL/2 = 3 \times 4/2 = \mathbf{6}$ kN each.
- $V_{max} = \mathbf{6}$ kN at the supports.
- $M_{max} = wL^2/8 = 3 \times 16/8 = \mathbf{6.0}$ kN · m at mid-span.

2.3

- It peaks at mid-span, where the shear diagram crosses zero.
- $dV/dx = -w(x)$ - the load intensity tilts the shear diagram.
- $dM/dx = V$ - the shear is the slope of the moment diagram.

2.4

- A hinge carries no moment: $M = 0$ at the hinge pin.
- A kink means the moment slope changes abruptly, and $dM/dx = V$ - a step in V, i.e. a point load.

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