



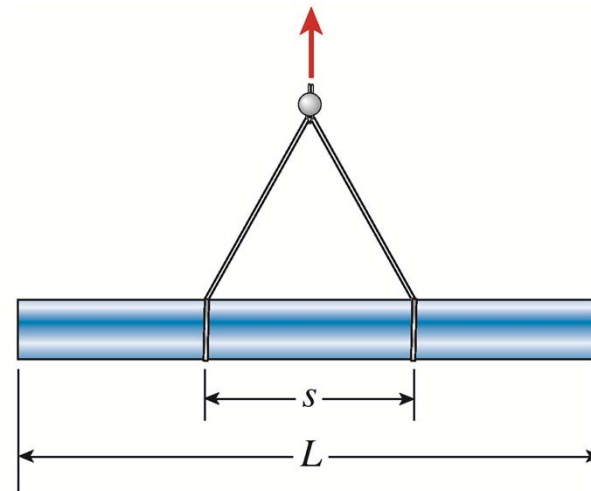
# 作業13、12/27習題

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- 5.5-11 、 5.5-12 、 5.5-16
- 5.6-2 、 5.6-11
  
- 100年1月3日 上課前繳交作業

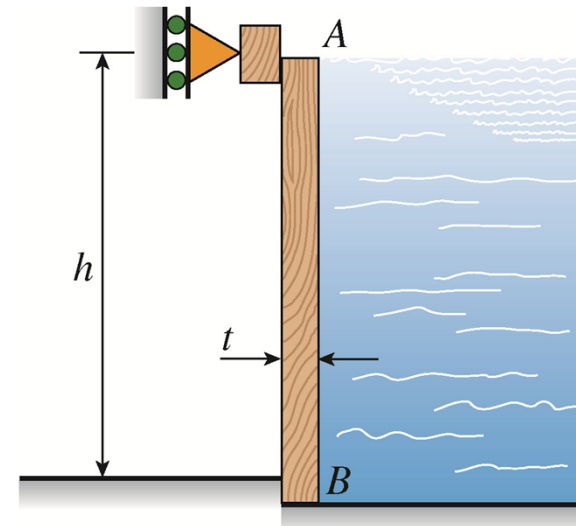
## 5.5-11

- A fiberglass pipe is lifted by a sling, as shown in the figure. The outer diameter of the pipe is 150 mm, its thickness is 6 mm, and its weight density is  $18\text{kN/m}^3$ . The length of the pipe is  $L=13\text{m}$  and the distance between lifting points is  $s=4\text{m}$ . Determine the maximum bending stress in the pipe due to its own weight.



## 5.5-12

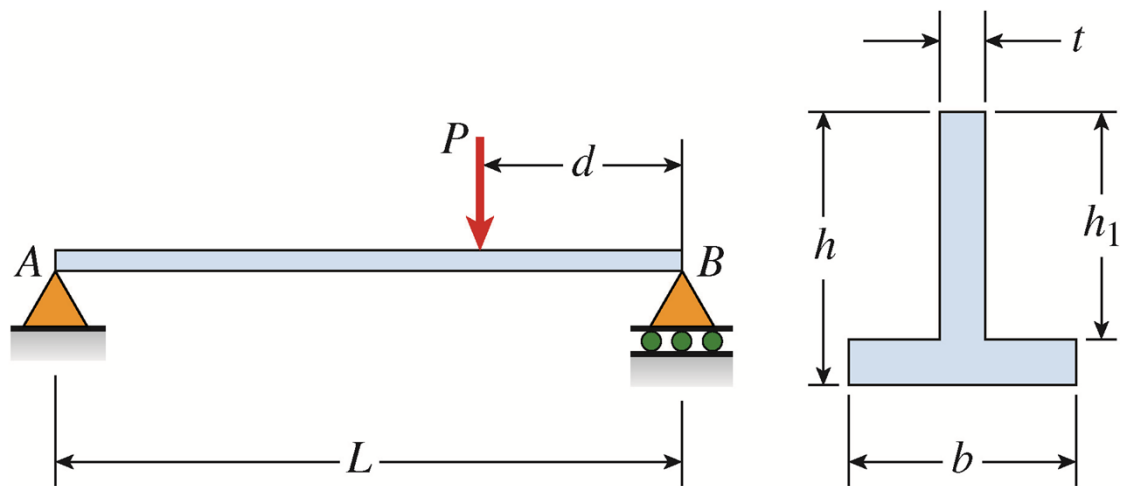
- A small dam of height  $h=2.0\text{m}$  is constructed of vertical wood beams  $AB$  of thickness  $t=120\text{mm}$ , as shown in the figure. Consider the beams to be simply supported at the top and bottom. Determine the maximum bending stress  $\sigma_{max}$  in the beams, assuming that the weight density of water is  $\gamma = 9.81 \text{ kN}\cdot\text{m}^3$



# 5.5-16

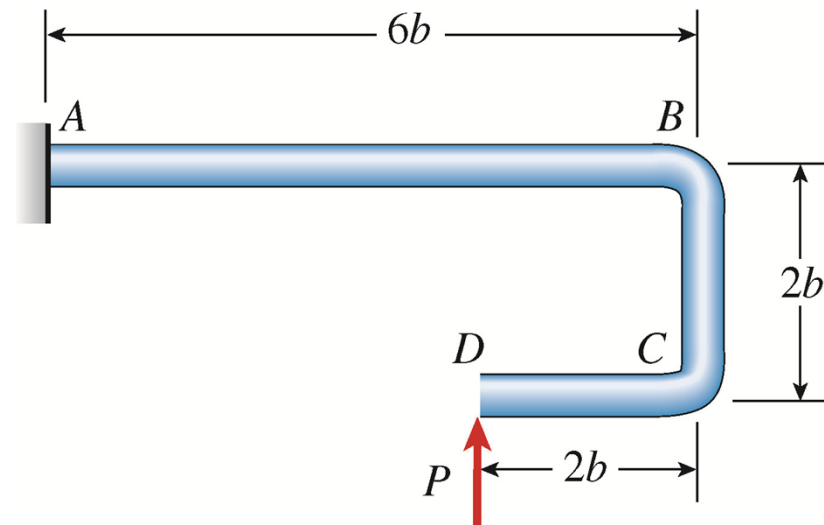
- Determine the maximum tensile stress  $\sigma_t$  and maximum compressive stress  $\sigma_c$  due to the load  $P$  acting on the simple beam AB(see figure).

Data are as follows:  $P = 6.2$  kN,  $L = 3.2$  m,  $d = 1.25$  m,  $b = 80$  mm,  $t = 25$  mm,  $h = 120$  mm, and  $h_1 = 90$  mm.



## 5.6-2

- A fiberglass bracket ABCD of solid circular cross section has the shape and dimensions shown in the figure. A vertical load  $p=40\text{N}$  acts at the free end D. Determine the minimum permissible diameter  $d_{\min}$  of the bracket if the allowable bending stress in the material is and 30 MPa and  $b=37\text{ mm}$ . (*Note:* Disregard the weight of the bracket itself.)



## 5.6-11

- A two-axle carriage that is part of an overhead traveling crane in a testing laboratory moves slowly across a simple beam  $AB$  (see figure). The load transmitted to the beam from the front axle is 9 kN and from the rear axle is 18 kN. The weight of the beam itself may be disregarded. (a) Determine the minimum required section modulus  $S$  for the beam if the allowable bending stress is 110 MPa, the length of the beam is 5 m, and the wheelbase of the carriage is 1.5 m. (b) Select the most economical standard-beam from Table E-2, Appendix E.

