

# MECHANICS

## 梁的弯曲应力

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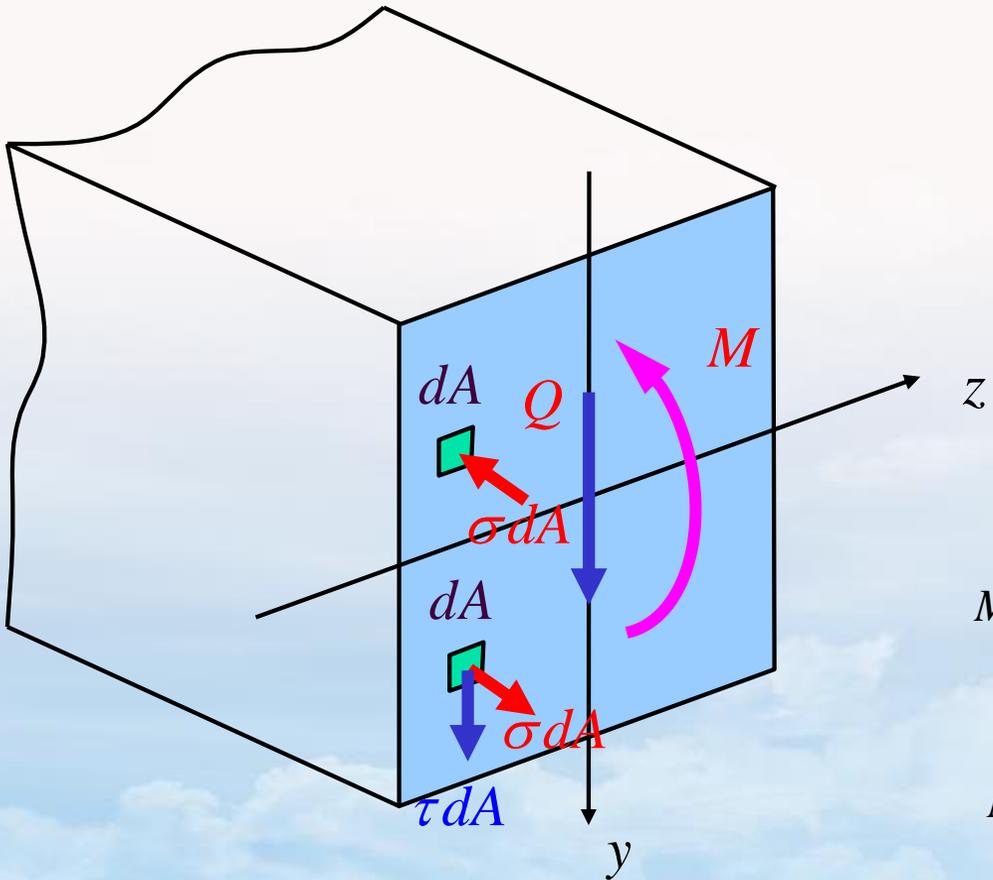
单 位：大连海事大学



# 纯弯曲



# 梁的应力



$$Q = \int_A \tau dA$$

$$M = \int_A y \cdot \sigma dA$$

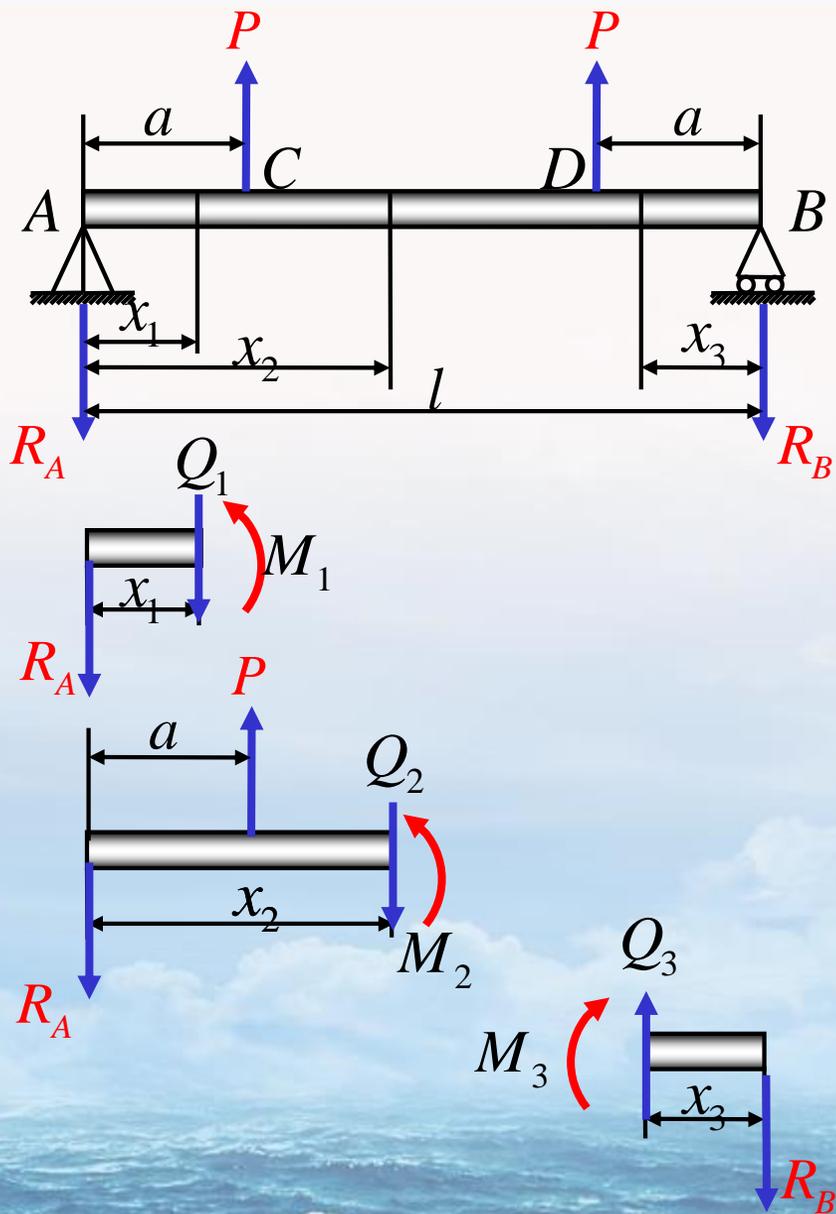


$M$  ( 横截面上存在 )  $M$

$M$  ( 1. 缩短力  $\tau$  )  $M$   
 $M$  ( 2. 正应力  $\sigma$  )  $M$   
伸长



# 梁的应力



解:  $R_A = R_B = P$

$$Q_1 = -R_A = -P$$

$$M_1 = -R_A \cdot x_1 = -P \cdot x_1$$

$$(0 \leq x_1 \leq a)$$

$$Q_2 = 0$$

$$M_2 = P(x_2 - a) - R_A \cdot x_2 = -Pa$$

$$(a \leq x_2 \leq l - a)$$

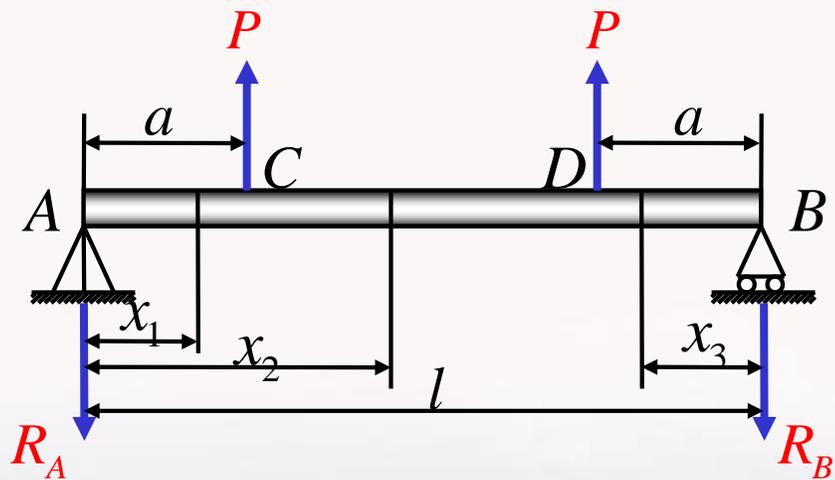
$$Q_3 = R_B = P$$

$$M_3 = -R_B \cdot x_3 = -P \cdot x_3$$

$$(0 \leq x_3 \leq a)$$



# 梁的应力



$$Q_1 = -P$$

$$M_1 = -P \cdot x_1$$

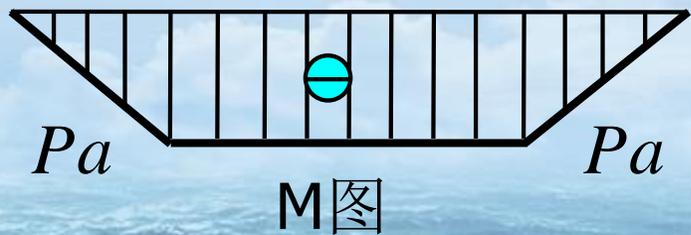
$$(0 \leq x_1 \leq a)$$



$$Q_2 = 0$$

$$M_2 = -Pa$$

$$(a \leq x_2 \leq l - a)$$



$$Q_3 = P$$

$$M_3 = -P \cdot x_3$$

$$(0 \leq x_3 \leq a)$$

纯弯曲



# 材料力学典型研究方法

