

QUESTION

1. A rectangular plate of length $2a$ and width $2b$ is subjected to a uniform load q acting downwards. The plate is supported by a pin support at the top-left corner and a roller support at the bottom-right corner. Determine the reaction forces at the supports.



$$\sum F_y = 0 \Rightarrow R_1 + R_2 - q(2a)(2b) = 0$$

$$\sum M = 0 \Rightarrow R_2(2a) - q(2a)(2b)(a) = 0$$



$$R_2 = \frac{q(2a)(2b)(a)}{2a} = 2qab$$

$$R_1 = q(2a)(2b) - R_2 = 4qab - 2qab = 2qab$$

ANSWER

The reaction forces at the supports are $R_1 = 2qab$ and $R_2 = 2qab$.