Theoretical Mechanics, Quiz 6: STATICS

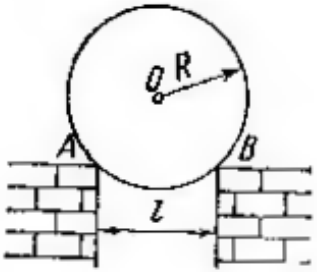
Statics

INNOPOLIS UNIVERSITY

Quiz 6

The circle with uniformly distributed length weight $P = 40$ and radius $R = 1$ lies on the brickwork. Distance between the walls $l = 1.6$.

Disregarding friction, find the circle pressure on the brickwork in points A and B.



Quiz 6, Task 1

Quiz 6: solution

1. Find α.

$$\cos\alpha = \frac{l}{2R},\ \sin\alpha = \sqrt{1-\left(\frac{l}{2R}\right)^2}$$

2. Equilibrium equations:

$$\begin{cases} N_a\cos\alpha - N_b\cos\alpha = 0 \\ N_a\sin\alpha + N_b\sin\alpha - P = 0 \end{cases}$$

3. Solution:

$$\begin{cases} N_a = N_b \\ 2N_a\sin\alpha = P \end{cases}$$

$$N_a = N_b = \frac{P}{2\sqrt{1-\left(\frac{l}{2R}\right)^2}} = 33.3$$