Answer on Question #49530 – Physics – Other

A cuboid of mass 350 kg was placed on an object with dimensions 3m*5m*2m. Find the pressure exerted by the cuboid on the object.

Solution:
$m = 350kg - mass\ of\ the\ cuboid;$
$a = 3m, b = 5m, c = 2m - dimensions\ of\ an\ object;$

Pressure is defined as force per unit area.
$$p = \frac{Force}{Area} = \frac{mg}{A}$$
There are different areas on which the cuboid can be placed on the object:
$$A_1 = a \cdot b; A_2 = a \cdot c; A_3 = b \cdot c$$
$$p_1 = \frac{mg}{ab} = \frac{350\ kg \cdot 9.8\frac{N}{kg}}{3m \cdot 5m} = 229\ Pa$$
$$p_2 = \frac{mg}{ab} = \frac{350\ kg \cdot 9.8\frac{N}{kg}}{3m \cdot 2m} = 572\ Pa$$
$$p_3 = \frac{mg}{ab} = \frac{350\ kg \cdot 9.8\frac{N}{kg}}{5m \cdot 2m} = 343\ Pa$$

Answer: pressure exerted by the cuboid on the object: $p = 229\ Pa; 572\ Pa, 343\ Pa.$