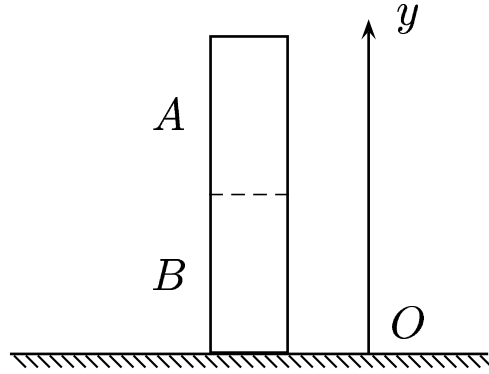


Consider the Empire State Building. For simplicity, assume that it is a tall uniform rectangular box.



Taking into account that gravitational acceleration decreases slightly with height, what would you expect?

- A) $y_{cg} < y_{cm}$.
- B) $y_{cg} = y_{cm}$.
- C) $y_{cg} > y_{cm}$.

Divide the building into two equal parts as shown in the sketch.

Center of gravity is at:

$$y_{cg} = \frac{m_A g_A y_A + m_B g_B y_B}{m_A g_A + m_B g_B} .$$

Apparently the B part has more weight.

Answer **A**.

12.02-01 Empire State Building 2004-4-6